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CHEST FLUOROGRAPHY WITH PORTABLE X-RAY EQUIPMENT ON 35 MM. FILM

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The demonstrations of Edwards (*1*) and others that routine roentgen examination of the chest of unselected adult groups brings to light appreciable numbers of previously unsuspected cases of early treatable and often sputum positive pulmonary tuberculosis have emphasized the need for a diagnostic procedure which is less expensive than the usual radiographic examination. Film cost limits sharply the number of such examinations that can be made. Consequently, the tuberculin test is being widely used in an attempt to select for roentgen examination those who are most likely to have lesions. This test is always refused by a certain portion of the population; another portion is lost through failure to return for one or more readings; even when ideally performed, it is something less than 100 percent selective. Levine (*2*) has reported the finding in many children of tuberculous infiltrations months before allergy develops. The negative reactors, moreover, are at once excluded from the benefits of a chest roentgenogram for demonstration of cardiovascular and nontuberculous pulmonary pathology. A roentgenographic examination which costs no more than a tuberculin test would have the advantage of ready acceptance by the public, the administrative simplicity and economy to the individual of a single instead of two or three clinic visits, and would provide information about chest pathology in every case.

Fluorography is the one procedure that gives promise of accomplishing this objective. By "fluorography" is meant the procedure, suggested by Caldwell in 1911 (*3*), of photographing in miniature with an ordinary camera the roentgen ray shadow on a fluoroscopic screen. Developed first on a practical basis by De Abreu (*4*), it has been widely studied here and abroad, and a number of installations with various combinations of equipment are now in operation. The roentgen spectrum covers so wide a band of wave lengths that the radiation cannot be brought to a point focus by any lens system, and a film size equal to that of the object is necessary for direct radiography. A fluorescent screen, on the other hand, gives off

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radiation in the narrow band of the visible spectrum when activated by roentgen rays, and this radiation can be focused. The fact that light intensity decreases inversely with the square of the distance from the source requires that greater power or longer exposure time be used to produce satisfactory films in a camera three feet from the screen.

Potter, Douglas, and Birkelo (*5*) using a Patterson "Fluorazur" screen and a specially constructed lens with 500 milliampere rotating anode X-ray equipment, have already demonstrated in an impressive series that fluorography with 4 by 5-inch X-ray film is sufficiently accurate for survey work. This method, while offering a tremendous saving over full-sized film technique, still requires individual processing and storage of films, and still costs about 10 cents per exposure. The equipment, moreover, in addition to being expensive, is hardly portable. The 35 mm. film used first by De Abreu offers such advantages in processing and storage, as well as economy in film cost and apparatus, that it continues to receive attention. These considerations and the practical immobility of the 4 by 5 apparatus led us to undertake the development, with portable equipment generously loaned by the Westinghouse X-ray Co., of a 35 mm. technique for survey work in rural areas.

THEORETICAL CONSIDERATIONS

1. *X-ray tube.*—Fine detail on either film or screen depends on the nearness to which the anode focal spot, the source of radiation in the tube, approaches a geometric point in size. The principle is similar to that of the pinhole camera, and the smaller the focal spot at a given anode-screen distance or the greater this distance for a given focal spot, the better the definition. Figure 1 illustrates the differences in definition in the shadow of a wire screen, mounted 8 inches in front of the cassette, obtained with three different X-ray tubes at 30- and at 48-inch distances. At 30 inches, the advantage of the 1.2 mm. focal spot is striking; at 48 inches, definition with the larger focus tubes is improved.

2. *Screen.*—Fluorescent "intensifying" screens are responsible for 90 to 95 percent of the density of any radiograph made with a cassette. All chest plates are made in this way. Such plates are actually fluorographs, made in direct contact with, rather than by photographic projection of, the fluorescent image. The belief of many roentgenologists that fluorescent screens show less detail than films is based on the blurring of detail due to afterglow as screen or patient is moved about during fluoroscopic examination, and on physiological inability to see as much contrast in the colored fluorescence as appears in the black and white film.

3. *Lens.*—Lenses with apertures of f 1.5 that will cover the 24 by 32 mm. field of the usual 35 mm. camera are commercially available. The diameter of the circle of confusion of the Leitz Xenon 50 mm. lens has been determined by Bouwers (*6*) to be 20 microns in the center and 30 microns in the extreme corner of such a field. This would permit enlargements of six diameters, or about 6 by 9 inches with no perceptible blurring due to lens unsharpness even in the corners when viewed from a distance of 10 inches. He concludes that the resolving power of the screen and the Xenon lens is great enough to reproduce all the details present in the original radiograph and points out that the loss of light intensity is mainly responsible for the loss in quality of the reduced radiograph.

4. *Film.*—Control of the various film factors of speed (sensitivity), spectrum specificity, contrast, gradation, and size of silver granules is largely empirical. In general, faster emulsions have larger grain size and less contrast; for a given emulsion, over-exposure, powerful developers, and high developing temperatures produce coarser grain than the reverse.

CAMERA UNIT

On the advice of Dr. Johannes Holm [1] of the State Serum Institute, Copenhagen, who has experimented with various screens, a 14 by 17-inch Siemens Supra-Astral screen was procured by the Westinghouse X-Ray Co. for this work. It is without visible grain and gives a greenish-yellow fluorescence. This screen, with the yellow protective covering removed, was mounted in a bakelite cassette with plate-lead glass substituted for the back. This served the double purpose of holding the screen in place and of protecting camera lens and film magazine from direct roentgen radiation. The cassette was mounted in the large end of a light-proof box 34 inches long in the shape of a truncated pyramid. A Leica Model F camera with 50 mm. Xenon f 1.5 lens was mounted outside the small end of the box, which was faced with 0.5 mm. sheet lead as an additional protection against roentgen radiation. The lens projected into the box through a felt-lined aperture, and the camera was held in place by a swivel clamp tightened by a wing nut.

With the camera in place, no light enters the box, and the screen lights up only when roentgen radiation strikes it. In making an exposure, the camera shutter is opened, the patient postured as usual in front of the cassette, and the X-ray tube energized for an appropriate time. This causes the screen to light up with the shadow of the chest, which is recorded on the film. When the radiation ceases, the screen becomes dark; the film is advanced, and the apparatus is ready for the next exposure.

[1] Personal communication, March 1939.

Since the standard Xenon lens mount will not permit focusing on objects closer than 42 inches, a steel ring was specially cut by the Leitz Company to provide sufficient extension to focus at 34 inches, at which distance the 14-inch dimension of the screen fills the width of the film field. The proper lens setting for critical focus was determined by stringing fine copper wire across the front of the cassette, making a series of exposures with various lens settings, and selecting the one which best resolved the images of the wire. The entire assembly is supported by a counterbalanced cable in a demountable 2 by 2-inch wooden frame. Wing nuts lock the apparatus at any desired height (see fig. 2).

TECHNIQUES AND MATERIALS

Over 1,500 persons have been examined with both conventional and micro-films. Since it is not feasible to describe all combinations of materials and techniques that have been tried, only salient factors will be discussed, and results will be presented rather empirically.

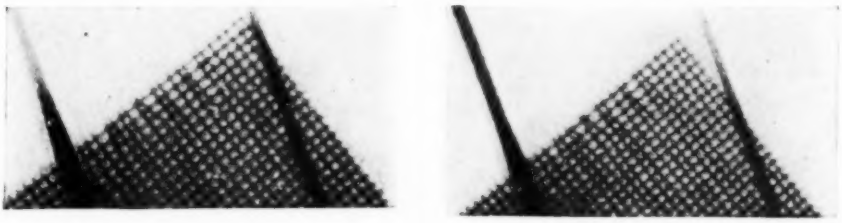
1. *X-ray units.*—The limitations both as to quantity and stability of commercially available power in schools, civic buildings, and county health department quarters made an X-ray unit operated by condenser discharge seem particularly attractive. In this type of unit the current which actually energizes the tube is stored in condensers and released at the proper time, rather than furnished directly by a transformer system. High milliamperages with consequent short exposure times and uniform film density out to the margins can be obtained with current from an ordinary lamp socket.

Several different types of X-ray equipment were tried and their results compared in order to select the most suitable apparatus for routine use. The Westinghouse X-Ray Co. loaned a "portable" condenser discharge unit, their "Dynex A," for trial. However, satisfactory film density and contrast were not obtained.

Two conventional type self-rectified mobile units—the 100-milliampere unit with 4.2 mm. focal spot (General Electric model R 36) of the Division of Tuberculosis of the Florida State Health Department, and a 30-milliampere unit with 3.0 mm. focal spot (Westinghouse Diadex) identical with that used in field diagnostic clinics by the Alabama State Health Department—were therefore compared. It was found that the larger unit sacrificed as much by the use of a 4.2 mm. focal spot as was gained by the reduction in time or increase in distance permitted with the higher power. The 30-milliampere "Diadex" proved most satisfactory for our purposes.

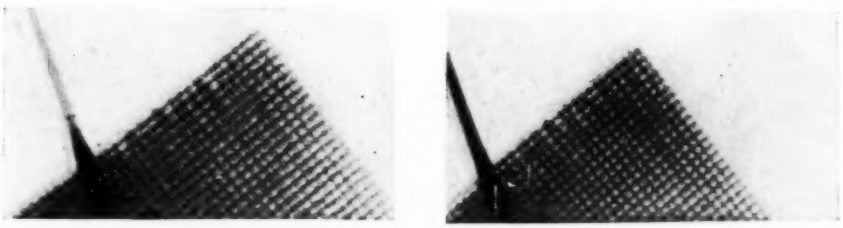
Anode screen distances of 28, 30, and 32 inches have been tried. These short distances require care in positioning of patient and centering of tube; a slight error in centering on a normal chest gave the appearance in fig. 3*a*.

Anode-screen distance 30″ Anode-screen distance 48″



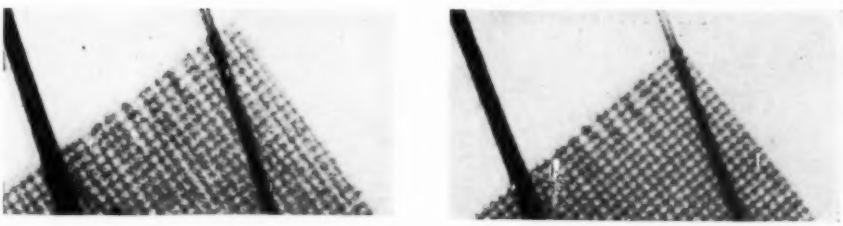
No. 1. No. 2

Fine focus tube (1.2 mm.).



No. 3. No. 4.

Medium focus tube (3.0 mm.).



No. 5. No. 6.

Broad focus tube (4.2 mm.).

FIGURE 1.—Effect of X-ray tube focal spot size and anode-screen distance on radiographic detail.

FIGURE 2.—Camera unit and Westinghouse "Diadex" portable X-ray.

Fluorographs made with portable unit

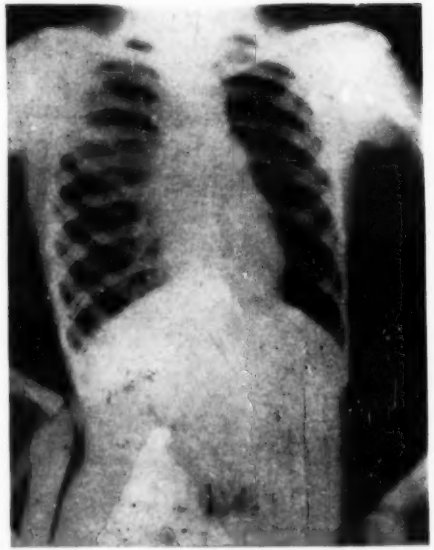


FIGURE 3a.—Normal chest with tube not centered, creating suspicious shadow on right.

FIGURE 3b.—Calcified pleura, resembling pneumonic infiltration.

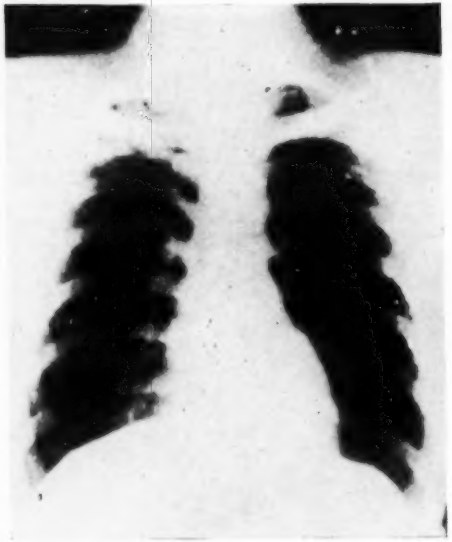


FIGURE 3c.—Reinfection type tuberculosis; right apex with strand in second interspace; calcification in second left interspace and left hilum.

Fluorographs made with portable unit

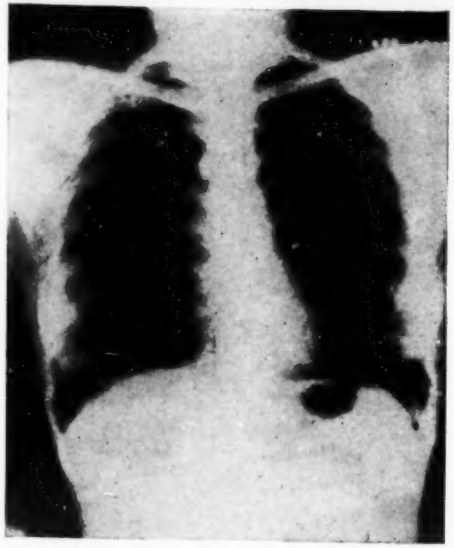


FIGURE 3*d*.—Probable first infection type lesion with calcification in both lung fields and hila.

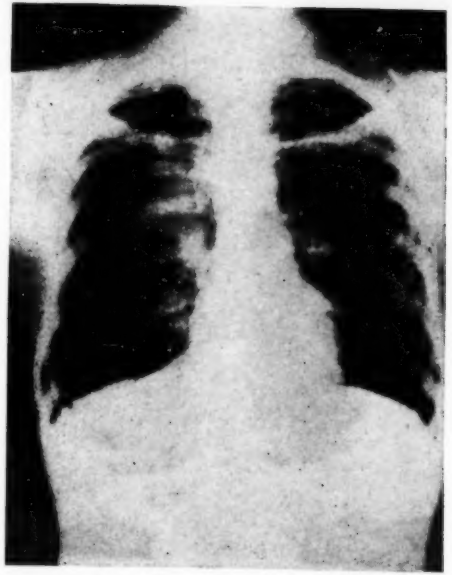


FIGURE 3*e*.—Artificial pneumothorax with some spread of disease to opposite midzone.

2. *Films and developers.*—One of us, working with R. D. Reed, photographer for the National Institute of Health, tested out the following developers on fast commercial films: Agfa 17, 47, 70, 72, and 79; Eastman D 19, D 76, and X-ray developer; Edwall 12.

Agfa 17 with a normal development time of 15 minutes gave the best results when the time was increased to 30 minutes. Eastman X-ray developer diluted one part to two of water also gave good negatives after 15 minutes' development. Agfa 70 gave good contrast but excessive grain. Results with the fastest commercial films were, however, not entirely satisfactory.

Within the past few months, both Agfa and Eastman have developed new emulsions especially sensitized to the spectra of fluorescent screens and have kindly furnished us a sample for trial. The Agfa "Fluorapid" emulsion was first available and was tried both on sanatorium cases and in field examinations with the most gratifying results yet obtained. Other than the use of this specially sensitized film, routine procedures and developers, if followed by a chrome alum hardening bath, gave satisfactory results. This chrome alum sodium bisulfite hardener shrinks and toughens the emulsion, remarkably increasing resistance to dust and scratches. Its use is indispensable on film subject to the manipulation of reading and review.

3. *Reading.*—Although gross lesions can be identified in the small film, the films must be enlarged, either by direct magnification or projection, for detailed reading. It is not, however, necessary to magnify or project to the original size. Roentgenologists have grown accustomed to reading large films because no reduction in size is possible without the fluorographic technique. Actually, reduced films are often easier to interpret because the entire chest area can be visualized at one time. This results in a tendency observed by both Potter (*5*) and the authors to grade lesions as more severe in reduced than in regular films. Reliable interpretation of miniature films requires some experience.

Since no screen can reflect the complete gradation of the original film, direct magnification is preferable to projection. The development of reading devices is being carried on independently by several manufacturers, and improved units are now appearing on the commercial market. Our procedure has been to place the film in a Leica "removable 35 mm. film strip attachment" (Catalog No. 75460), equipped with window and spools, and examine by transmitted light with a 4-inch lens. A 2-inch lens is occasionally used when greater magnification is desired.

4. *Radiographic technique.*—When portable X-ray equipment is used in the field, differences in wiring and current supply from place to place introduce additional variables into the standard technique employed with permanent installations. The maximum obtainable

milliamperage is always used and may vary from 15 to 30, requiring that exposure time be varied, in addition to the usual variation of kilovoltage according to thickness. For chests measuring less than 20 centimeters, 12 to 15 milliampere seconds are used, with increase up to 20 for larger chests.

The factors may be summarized as follows:

a. Distance: 30 inches from anode to screen.
b. Effective kilovoltage: Three times the chest measurement in centimeters.
c. Exposure time: ½ second unless poor current requires increase to obtain sufficient milliampere seconds.

FIELD EXAMINATIONS

In cooperation with the Tennessee State Department of Public Health, 121 cases and family contacts were examined by both regular and 35 mm. film. The films were made in six different county health department clinics where the usual current variations were encountered.

On the first 33 cases, only a single micro-film was made; on the remaining 88, two films were made on each case with the tube lowered 2 inches for the second exposure. There were 5 tuberculous lesions demonstrated by regular film among the first series of 33 examinations, 1 of which was first overlooked in the somewhat overexposed micro-film. This was a minimal lesion faintly visible on review.

The results of independent examination by two readers of the 88 films in the second series are set forth in the following table:

Comparison of 88 micro and regular roentgenograms

	Regular film	Missed on micro-film	
		Reader 1	Reader 2
Childhood tuberculosis	2	0	0
Reinfection tuberculosis:			
Latent apical	2	1	1
Minimal	7	2	2
Moderate	1	0	0
Far advanced	7	0	0
Suspected	3	0	0
Total positive	22	3	3
Negative	66	2	7
Total	88	5	10
Percent missed		5.7	11.4
Calcification:			
Positive	29	10	3
Negative	59	0	2
Total	88	10	5
Percent missed		11.4	5.7

Reader 1, although comparatively inexperienced in radiographic interpretation, had the benefit of previous experience with micro-film and reported fewer false positives. Reader 2 has had years of experience in chest diagnostic work, read calcification more accurately than Reader 1, and with a little experience would probably also better his score on significant pathology.

Actually, only one of the three reinfection type lesions missed in this series appeared from the regular film to be clinically significant. The latent apical and the other minimal lesion were considered of doubtful or no significance.

DISCUSSION

These results, particularly from the standpoint of clinical significance, are definitely encouraging. Additional refinement of technique to compensate for variations in milliamperage should produce better and more uniform pictures. Experience in reading the small films is necessary and will reduce errors in interpretation (*7*). The routine used by Holm (see footnote 1) of making two films at different tube levels on each patient will bring all the lung fields into the interspaces in one or the other exposure, and, with little added expense, eliminate a long recognized source of error in single plate examinations.

Radiographic technique is made up of compromises. Shortening anode-screen distance reduces exposure time but increases distortion and reduces definition; reducing the size of the anode focal spot gives better detail but reduces the power that can be used. Raising voltage increases penetrating power of the rays, but reduces contrast in the resulting film.

Experience with low-powered portable equipment in the rural South where none other is available to most of the population indicates that the importance of extremely short exposure times in routine chest radiography has been overemphasized. The heart border and adjacent structures are, of course, blurred in exposures of ½ to 1 second, but significant shadows in that area are rare and when present are usually sufficiently recognized so that the person is at least called back for reexamination. The greater detail brought out by the high-powered equipment and short exposures undoubtedly permits refinement of differential diagnosis but adds little to the value of the roentgenogram as a screen to select individuals with unsuspected pathology. The timely article of Spillman (*8*) emphasizes the paramount importance of intelligent experience in any radiographic work, regardless of the type of equipment used.

As pointed out by Exner (*9*) in an admirable discussion of the problems of roentgen diagnosis of chest pathology, there is a tendency prevalent among roentgenologists to go beyond objective interpretation and to read pathology, diagnosis, and prognosis into nonspecific

shadows. In mass surveys where little or no clinical information is at hand on the individual case, the interpretation must be both objective and conservative as to definitive diagnosis. The function of such surveys should be to single out for diagnosis and treatment individuals with hidden pathology that may be of consequence to themselves and the community. Differential diagnosis, including the tuberculin test, stereoscopic and oblique X-rays, should *follow* the screening procedure.

The paramount place of the X-ray in mass screening is also emphasized by Reid (*10*), who summarizes the experience of the Metropolitan Life Insurance Company with preemployment examinations. Of 200 clinically significant cases of reinfection type tuberculosis among 25,000 white applicants, 137 or 68.5 percent were discovered only by means of X-ray, after history and physical examination had failed to indicate pathology. Fluoroscopic screening in these examinations was calculated to lack about 13 percent of the accuracy of the full sized radiograph, but is being continued by the company as a useful, practical, economically feasible procedure. In like manner, fluorography is presented, not as a perfected method for final diagnosis, but as a practical procedure, worthy of consideration and further development, for bringing the advantages of X-ray examination to communities and individuals which would otherwise be passed by.

CONCLUSION

Although there is need for further development of techniques and materials, fluorography with 35 mm. film and portable X-ray equipment offers promise as a practicable procedure for screening purposes and for large-scale tuberculosis case finding in rural areas at reasonable cost.

ACKNOWLEDGMENTS

It is desired to acknowledge with special thanks the help and advice of Mr. F. P. Meredith of the Westinghouse X-Ray Co. in technical matters, of Dr. R. S. Gass of the Tennessee State Department of Public Health in reviewing comparative series of films, of Dr. Norman Van Wezel of the Montgomery County Tuberculosis Sanatorium in providing space and selecting patients for examination, of Dr. A. J. Logie and Mr. James Morehouse of the Florida State Health Department in making the study with their 100-milliampere unit, and of the patients and personnel at the Montgomery County Sanatorium and of county health departments in Alabama, Tennessee, and Florida in aiding the study. The courtesy of the Eastman and Agfa-Ansco companies in furnishing film for trial is also acknowledged. Finally, special thanks are due the Westinghouse X-ray Co. whose unstinting provision of equipment has made this work possible.

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QUALIFICATIONS OF PROFESSIONAL PUBLIC HEALTH PERSONNEL [1]

II. HEALTH OFFICERS AND OTHER MEDICAL PERSONNEL

By Mayhew Derryberry, *Senior Health Education Analyst*, and George Caswell, *United States Public Health Service*

The medical profession furnishes much of the leadership in the field of public health. Not only do physicians in health departments render or supervise all medical services, but, as health officers, in almost all departments, they plan and administer the entire program.

For efficient service to the public, therefore, it is essential that these responsible positions be held by men and women who are not only well qualified in the sciences and the art of medicine, but also prepared by additional instruction in the specialty of public health, its problems and techniques. It is the purpose of this paper to present findings as to the training and experience of health officers and other medical workers now in service, as revealed by the questionnaire survey conducted recently by the Public Health Service.[2]

[1] From Division of Public Health Methods, National Institute of Health. This is the second in the series: Qualifications of Professional Public Health Personnel. The first paper, I. Plan and Scope of the Survey, was published in the Public Health Reports, 55: 2312 (1940).

This survey was made possible through the cooperation of State and local health officers and members of their staffs throughout the country. Assistance in the preparation of these materials was furnished by the personnel of the Works Progress Administration, Official Project No. 765-23-3-2.

[2] Complete details on the scope and plan of the survey are given in the first paper of this series.

Among the 16,670 full-time public health workers who submitted schedules, 2,076 are members of the medical profession. However, only 1,956 of that number are employed in strictly medical tasks. Some work in sanitary corps, others direct or work in laboratories or are health educators. Inasmuch as each individual is classified for the analysis according to his function rather than his profession, this report is concerned with the 1,956 physicians who are health officers or perform other tasks that are primarily medical. Because of similarity of function, the 89 nonmedical health officers who submitted schedules are included for the analysis with the other health officers, and summarized information for them will be included in the tables wherever it is feasible to do so.

ADMINISTRATIVE CLASSIFICATION OF PHYSICIANS

Using administrative responsibility as a basis, the physicians reporting have been roughly divided into three categories: (*a*) Health officers, (*b*) administrative physicians, i. e., deputy health officers, bureau directors and others with some administrative responsibility, and (*c*) staff physicians.[3] The number in each category in each of the types of jurisdictions appears in table 1.

TABLE 1.—*Health officers and other medical personnel in 1,114 jurisdictions, by type of jurisdiction and classification of position*

Jurisdiction	All physicians		Medical health officers		Administrative physicians		Staff physicians		Nonmedical health officers
	Number	Percent	Number	Per cent	Number	Percent	Number	Percent	
Total	1,956	100.0	947	48.4	579	29.6	430	22.0	89
State	487	100.0	39	8.0	302	62.0	146	30.0	----
County	951	100.0	771	81.0	146	15.4	34	3.6	1
City	518	100.0	137	26.4	131	25.3	250	48.3	88

Out of 1,114 jurisdictions, schedules were obtained from only 1,036 health officers. This was somewhat surprising since information was collected only from jurisdictions with full-time executive heads; but a number of health officers who sent schedules for other members of their staffs failed to send their own. All such cases were routinely followed up in an attempt to complete the data, but in a number of instances the effort was not successful. In a few cases the position of health officer was vacant or the incumbent was temporarily in training, on leave, or away for some other reason.

[3] Among staff physicians are the following titles: Clinic physician; epidemiologist, immunologist, or malariologist (if not a bureau director); medical inspector; pediatrician; health officer trainee; city physician; and school physician.

It is significant that cities employ 88 of the 89 nonmedical health officers reporting. Seventy-three of them are in 3 States in which nonmedical health officers serve two-thirds of the city jurisdictions reporting.

The number of staff physicians about whom data were obtained is relatively small because in many departments staff physicians rendering direct service are part-time workers, and, therefore, are excluded from consideration in this study. Cities have more full-time staff physicians than either the States or counties, probably owing to the high concentration of problems in a small administrative area. States, on the other hand, employ a relatively large number of administrative physicians to direct specific medical services and act as consultants to local health departments.

Four-fifths of the full-time physicians in the counties are health officers. This is to be expected because of the prevalence of relatively small county units in which the only medically trained employee not only serves as administrator but also conducts the medical functions of the department, sometimes assisted by part-time personnel.

Medical workers in public health are predominantly white males. Only 102 women physicians submitted schedules. Since, however, the relative number of women physicians is small, this disproportion is to be expected. Nine of the women are health officers. Of the remainder, approximately half are occupying administrative positions. Five nonmedical health officers are women.

AGE

The distribution of each of the categories of personnel by age appears in table 2. Health officers are the oldest group and staff physicians the youngest, although the differences are relatively small. The outstanding fact in the table, however, is that nonmedical health officers are much older than any of the groups of physicians. In addition to being an average of 6 years older than the other health officers, it may be pointed out that 61 percent are at least 50 years old, whereas only 42 percent of medical health officers, the oldest physicians, have attained that age.

TABLE 2.—*Health officers and other medical personnel by age*

Age, years	All physicians	Medical health officers	Administrative physicians	Staff physicians	Non-medical health officers
	Number				
All ages	1,956	947	579	430	80
25–29	188	77	63	48	2
30–34	378	178	117	83	4
35–39	302	120	104	78	5
40–44	214	80	66	68	10
45–49	179	85	46	48	12
50–54	172	94	51	27	20
55–59	207	120	54	33	8
60–64	150	86	40	24	11
65 and over	149	98	32	19	15
Unknown	17	9	6	2	2
Average, years	44.7	46.6	43.4	42.5	52.6
	Percentage				
All ages	100.0	100.0	100.0	100.0	100.0
25–29	9.6	8.1	10.9	11.2	2.2
30–34	19.3	18.8	20.2	19.3	4.5
35–39	15.4	12.7	18.0	18.0	5.6
40–44	10.9	8.4	11.4	15.8	11.2
45–49	9.2	9.0	8.0	11.2	13.5
50–54	8.8	9.9	8.8	6.3	22.5
55–59	10.6	12.7	9.3	7.7	9.0
60–64	7.7	9.1	6.9	5.6	12.4
65 and over	7.6	10.3	5.5	4.4	16.9
Unknown	.9	1.0	1.0	.5	2.2

EDUCATIONAL QUALIFICATIONS

ACADEMIC TRAINING

Within the memory of many public health workers, a student desiring to become a physician could proceed directly to professional school after high school graduation or in some instances could take professional training before completing high school. More recently, medical schools have required prospective students to have a certain minimum of academic college work before admitting them to professional training. These changes in entrance requirements are recognized; but, since in our sampling the number who did not report high school graduation prior to entrance to professional school is extremely small, no tabulations of high school training have been made.[4] The analysis of academic training is, therefore, limited to collegiate work.

The academic preparation reported by health officers and other medically trained public health workers is shown in table 3. Each individual is tabulated at the highest level of training he has attained; for example, physicians reporting graduate academic work are as-

[4] Since among schedules submitted by physicians, a number not reporting graduation from high school seemed to be incomplete in other respects, it is believed the recording was faulty. The resultant error is small.

sumed to have completed undergraduate study and those having degrees are tabulated at that level regardless of the number of years of study reported. In academic preparation, administrative physicians rank first, staff physicians second, and health officers last; but there is little difference between the levels of training attained by the two latter groups. Half the medical personnel have had enough academic training to get at least a bachelor's degree; 8 percent have taken graduate academic work. One-fifth of the total report no academic college work; the remainder have had a year or more.

The proportion of physicians without academic college training is approximately that reported in the 1930 survey by the White House Conference,[5] but the proportion with 4 years or more of such training has doubled since 1930. It would appear, therefore, that public health physicians now in service have, as a whole, a considerably higher level of basic educational attainment than did those reporting 10 years ago.

TABLE 3.—*Levels of academic training reported by health officers and other medical personnel*

Level of academic training reported	All physicians	Medical health officers	Administrative physicians	Staff physicians	Nonmedical health officers
	Number				
Total	1,956	947	579	430	89
No academic college	396	222	95	79	63
1-2 years, no degree	368	182	100	86	10
3-5 years, no degree	218	110	52	56	4
Bachelor's degree, no graduate training	819	360	279	180	7
Graduate training	155	73	53	29	5
Less than 1 year	10	6	2	2	----
1 year but not 2 years	59	29	17	13	1
2 years or more	69	32	25	12	4
Unknown amount	17	6	9	2	----
	Percentage				
Total	100.0	100.0	100.0	100.0	100.0
No academic college	20.3	23.5	16.4	18.4	70.8
1-2 years, no degree	18.8	19.2	17.3	20.0	11.2
3-5 years, no degree	11.1	11.6	9.0	13.0	4.5
Bachelor's degree, no graduate training	41.9	38.0	48.2	41.9	7.9
Graduate training	7.9	7.7	9.1	6.7	5.6
Less than 1 year	.5	.6	.3	.5	----
1 year but not 2 years	3.0	3.1	2.9	3.0	1.1
2 years or more	3.5	3.4	4.3	2.7	4.5
Unknown amount	.9	.6	1.6	.5	----

In contrast to the medical personnel, nonmedical health officers are conspicuously poorly trained. Almost three-fourths of them have had no academic college education, and only 13 percent have academic degrees. The lack of fundamental education among these workers

[5] The tables summarizing the White House Conference survey are difficult to interpret, inasmuch as 18.8 percent of the personnel reporting did not specify the amount of college training. If it is assumed that the majority of these are without college training, the superiority of the training level of the present personnel is more apparent.

is even more striking when one considers that all physicians have professional training in addition to their academic work but few nonmedical health officers have any professional training (see tables 4 and 5).

When training is analyzed by jurisdiction, it is found that city employees have much less training than those in the States and counties. The difference is particularly striking when the nonmedical health officers, almost all of whom are in cities, are included with the other city personnel. State health department physicians have more training than those in counties, but this is largely accounted for by the excess, in State health departments, of administrative physicians who have more academic training than the other groups.

PROFESSIONAL TRAINING

In addition to their academic education, four-fifths of the medical personnel have had 4 years of professional training, with a small proportion reporting less, and approximately the same proportion more than 4 years (table 4).

TABLE 4.—*Professional training*[1] *reported by health officers and other medical personnel*

Years of professional training reported	All physicians	Medical health officers	Administrative physicians	Staff physicians	Nonmedical health officers
	Number				
Total	1,956	947	579	430	89
None					[2] 65
1					5
2	24	17	3	4	2
3	96	63	21	12	9
4	1,594	746	488	360	3
5	47	20	20	7	1
6 or more	51	23	15	13	
Unspecified	144	78	32	34	4
	Percentage				
Total	100.0	100.0	100.0	100.0	100.0
None					73.1
1					5.6
2	1.2	1.8	0.5	0.9	2.2
3	4.9	6.7	3.6	2.8	10.1
4	81.5	78.8	84.3	83.8	3.4
5	2.4	2.1	3.5	1.6	1.1
6 or more	2.6	2.4	2.6	3.0	
Unspecified	7.4	8.2	5.5	7.9	4.5

[1] Exclusive of training in nursing or public health.
[2] Includes 24 whose only professional training is in public health.

Again, nonmedical health officers are conspicuous for their lack of training. The majority of those that have had any professional education have had less than 4 years. Furthermore, the kind of training taken varies widely, including preparation for employment in such

fields as engineering, nursing, and veterinary medicine. The group with no professional training includes 24 who have had some public health training, details of which will be shown in table 6.

TOTAL YEARS OF TRAINING

Educational attainment was not always reported in the same way, partly because of individual interpretations of the schedule and partly because of different methods of assigning credits in schools and colleges. In order to portray the total length of training, "years of academic education" has been combined with "years of professional training" for each individual, with the result shown in table 5. In a few instances individuals are tabulated as having more training than they have actually received, because a bachelor's degree was uniformly credited as the equivalent of 4 years of academic training. This unavoidable error, however, applies chiefly to physicians who took only 3 years of academic work but were granted bachelor's degrees after successful completion of the first year of a subsequent professional course.

TABLE 5.—*Aggregate years of college training, both academic and professional,*[1] *reported by health officers and other medical personnel*

Aggregate years of training of college level	All physicians	Medical health officers	Administrative physicians	Staff physicians	Nonmedical health officers
	Number				
Total	1,956	947	579	430	89
None					24
1					2
2	8	7		1	10
3	40	32	5	3	11
4	262	144	62	56	9
5	85	42	23	20	2
6	275	130	79	66	3
7	193	95	53	45	
8	800	351	271	178	2
9	74	38	21	15	
10 or more	68	29	27	12	
Unspecified	151	79	38	34	26
	Percentage				
Total	100.0	100.0	100.0	100.0	100.0
None					27.0
1					2.2
2	0.4	0.7		0.2	11.2
3	2.0	3.4	0.9	.7	12.4
4	13.4	15.2	10.7	13.0	10.1
5	4.3	4.4	4.0	4.7	2.2
6	14.1	13.7	13.6	15.3	3.4
7	9.9	10.0	9.1	10.5	
8	40.9	37.1	46.8	41.4	2.2
9	3.8	4.0	3.6	3.5	
10 or more	3.5	3.1	4.7	2.8	
Unspecified	7.7	8.4	6.6	7.9	29.3

[1] Exclusive of public health and nursing.

As has appeared in previous tables, nonmedical health officers are, on the whole, lacking in both academic and professional training.[6] All but 48 of the 1,956 physicians report at least 4 years of training. Almost half of them have had at least 8 years of education beyond high school; three-fourths have had 6 years or more. It is obvious that, insofar as the amount of college and professional education received can be used as a criterion, practically all physicians in health departments have good basic training.[7]

PUBLIC HEALTH TRAINING

The amount of specific training in public health is, however, of greater importance to the quality of service rendered than general educational background. Table 6, summarizing the extent of such training, is constructed in the manner used in previous tables on education in that individuals are tabulated at the highest level attained. It is, however, not correct to assume in this case that a person tabulated at a given level of public health training has necessarily had preparation or instruction comparable with that of all others similarly tabulated. Not only have public health training institutions not stabilized hierarchies of training such as are found in the academic field, but it is also highly probable that at least a part of the instruction in public health shown in the table was not given by recognized public health training schools. In the emergency effort to improve the character of health service within the past few years, short special courses in the field or under State auspices have grown in popularity. Such courses do not, however, fit into the usual educational pyramid. In the table, therefore, preference has been given to instruction designated as graduate public health training.

Almost half the physicians in official agencies have had no training in public health. An additional quarter have had only "special" courses, that is, largely in-service training. In this connection it should be pointed out that persons reporting attendance at "short-term" courses in graduate public health training schools were not tabulated in the "special" courses category, whenever the institution and course were identifiable. Instead, they were included in the group having graduate public health training and given credit for the length of the course taken.

[6] Five nonmedical health officers are veterinarians; 2 have degrees in law; 2, in engineering; 1, in dentistry; and 1, in pharmacy.

[7] In addition to their medical degrees, small groups of physicians have other professional degrees. The largest of these groups, 40 in all, reported degrees in pharmacy. Others have degrees in surgery, dentistry, veterinary medicine, law, and engineering.

TABLE 6.—*Public health training reported by health officers and other medical personnel*

Graduate public health training reported	All physicians	Medical health officers	Administrative physicians	Staff physicians	Nonmedical health officers
	Number				
Total	1,956	947	579	430	89
None	907	321	256	330	58
Special courses only	461	281	129	51	24
Less than 1 year	184	138	37	9	
1 year	342	175	132	35	1
2 years or more	62	32	25	5	6
Certificate in public health	267	156	91	20	4
Bachelor of science in public health	1		1		
Diploma in public health	7	5	2		
Master's degree in public health	87	40	38	9	
Doctorate in public health [1]	65	34	28	3	1
	Percentage				
Total	100.0	100.0	100.0	100.0	100.0
None	46.4	33.9	44.2	76.7	65.2
Special courses only	23.5	29.7	22.3	11.9	27.0
Less than 1 year	9.4	14.6	6.4	2.1	
1 year	17.5	18.5	22.8	8.1	1.1
2 years or more	3.2	3.3	4.3	1.2	6.7
Certificate in public health	13.7	16.5	15.7	4.7	4.5
Bachelor of science in public health	[2]		0.2		
Diploma in public health	0.4	0.5	0.3		
Master's degree in public health	4.4	4.2	6.6	2.1	
Doctorate in public health [1]	3.3	3.6	4.8	0.7	1.1

[1] 3 physicians with doctorates in public health each have a Ph. D. or D. Sc. with a major in public health.
[2] Less than 0.1 percent.

One physician in five has had as much as a year's training in public health—the amount recommended by the Committee on Professional Education of the American Public Health Association.[8] Only 8 percent have public health degrees; an additional 14 percent have certificates in public health.

It is encouraging to compare these findings with those of the White House Conference in 1930. There are now relatively twice as many workers with a year or more of public health training as there were then. On the other hand, the proportion reporting no public health training (46 percent) is almost the same now as in 1930 (49 percent).

Comparisons of the two bodies of data are limited by the fact that 17.9 percent of those reporting in the White House Conference survey did not specify the amount of public health training they had. If, as is most likely, a major portion of these had no training, then the improvement over 1930 is greater than these figures show.

Medical health officers report the smallest relative number of untrained workers, but, unfortunately, many of them have had only special courses; the proportion in this category is higher for health

[8] The Educational Qualifications of Health Officers, Committee Report. Am. J. Pub. Health, 29; 1342-43 (December 1939).

officers than for any other group. Although almost half the administrative physicians have had no training, that group also has the largest proportion with one or more years of training and consequently the largest relative number of certificates or degrees.

Three-fourths of the staff physicians have had no public health training and fewer than 10 percent report as much as one year. It is true that many of the staff physicians are serving in child-health stations, schools, and clinics; and, therefore, their lack of public health training is much less of a detriment to efficient service than it otherwise might be. There is, however, little doubt that they would profit from the more comprehensive knowledge of the principles of public health to be obtained from specific training in the profession.

Nonmedical health officers appear no better prepared in public health than in the academic and professional fields. Out of the 89 reporting, only 7 have had as much as a year of public health training. Twenty-four others have had some in-service training but 58, or almost two-thirds of the total, have had no training in the field in which they are working.

At the bottom of table 6 is a summary of degrees and certificates in public health held by the various classes of physicians. As Meleney has said, "While the mere possession or lack of a professional degree cannot be taken as a measure of * * * efficiency * * *, it does give some indication of the extent of * * * accredited educational equipment." [9] Although the number holding degrees is relatively small (fewer than 9 percent of the total), there is, nevertheless, considerable variety in the types reported. Not all the degrees shown are strictly comparable since the requirements for the various degrees differ widely among schools. The questionnaire by which these data were collected did not request that individuals report schools from which they had obtained degrees or other evidences of educational attainment. However, even if all public health degrees and certificates held by health department physicians were from schools recognized as outstanding, the relative number of degree holders in any of the categories is smaller than is compatible with a staff adequately trained to render an efficient service.

When the data are classified according to type of jurisdiction in which the physicians are employed (table 7), it is apparent that physicians in city health departments have far less training than those in State or county departments. The great differences between jurisdictional groups is partly accounted for by the relatively high proportion of staff physicians in cities, coupled with the fact that 85 percent of city staff workers have had no public health training. However, lack of training in public health is also characteristic of each of the

[9] Certain Criteria on the Qualifications and Preparation of Health Officers, by Henry E. Meleney. Am. J. Pub. Health, 28: 423-429 (April 1938). The quotation is from p. 424.

other administrative classes of city personnel. Although health department physicians, as a class, need additional public health training, those in city departments appear to need it most.

TABLE 7.—*Public health training reported by physicians and nonmedical health officers, by type of employing jurisdiction*

Graduate public health training reported	Physicians				City nonmedical health officers [1]
	Total	State	County	City	
	Number				
Total	1,956	487	951	518	89
None	907	230	298	379	58
Special courses only	461	86	306	69	24
Less than 1 year	184	34	141	9	
1 year	342	118	180	44	1
2 years or more	62	19	26	17	6
Certificate granted	267	74	166	27	4
Degree granted	160	62	68	30	1
	Percentage				
Total	100.0	100.0	100.0	100.0	100.0
None	46.4	47.2	31.3	73.2	65.2
Special courses only	23.5	17.7	32.2	13.3	27.0
Less than 1 year	9.4	7.0	14.9	1.7	
1 year	17.5	24.2	18.9	8.5	1.1
2 years or more	3.2	3.9	2.7	3.3	6.7
Certificate granted	13.7	15.2	17.5	5.2	4.5
Degree granted	8.2	12.7	7.2	5.8	1.1

[1] One is a county health officer (with no training in public health).

In an effort to overcome the lack of public health training among personnel currently employed, the Social Security Act provided funds from which stipends and fellowships could be granted to workers for postgraduate study in public health. That this provision has stimulated the movement toward a better trained personnel is evidenced by a comparison of the training of physicians appointed to their present positions since 1935, with that of physicians who have worked in their present jurisdictions 3 years or more. Such a separation does not altogether limit the first group to those who have just entered public health work, since a mere change in locality was classified as a "change of position" even though the individual might still work under the same State organization. Nevertheless, the data indicate that physicians recently employed are better trained than are those employed in their present jurisdictions prior to 1935.

Twenty-six percent of the newly employed group have public health certificates or degrees; 41 percent have had no public health training. Among the older group, only 19 percent have such certificates or degrees and 52 percent are without training. This difference between those recently employed and those with longer experience is most

marked in city health departments, although the relative number of new employees is small. Among older physicians in city jurisdictions only 7 percent have public health certificates or degrees; among those most recently employed 20 percent have such certificates or degrees. The effect of the funds is further shown by the fact that 67.9 percent of the degrees granted between 1935 and 1938 to health officers and administrative physicians were in public health, compared to only

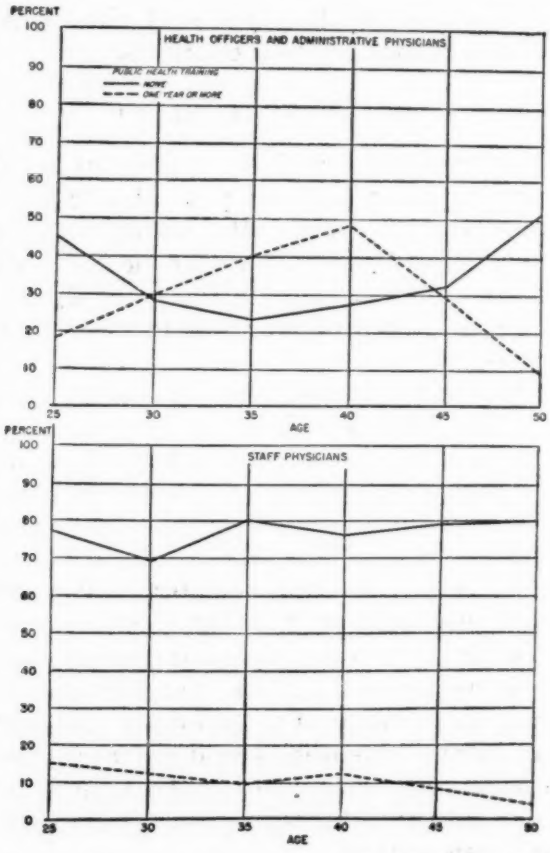

FIGURE 1.—Public health training of health department physicians—percentages of age groups with specified public health training. (In this figure age 25 equals 25–29, 30 equals 30–34, etc.)

28.1 percent of degrees in public health during the preceding 3-year period.

Although the data on workers recently employed in their present positions show a trend toward the appointment of trained individuals, analyzing levels of training by age of worker (see figure 1) indicates that many of the youngest physicians had had no public health training in the latter months of 1938. Almost half of the health officers and administrative physicians under 30 report no formal public health training. This proportion is higher than for any other age group

except the oldest, age 50 or over. Only 18 percent of the young administrators under 30 had had as much as one year of public health training, a proportion smaller than for any other age group except the oldest. This may reflect the tendency in many health departments to appoint young men for a period of orientation and observation before investing in their training. Among staff physicians, the proportion of those under 30 with no training is approximately the same as for any other age group. There is, however, an indication that relatively more of the young staff physicians than of the older ones had had at least one year of training.

EMPLOYMENT EXPERIENCE

Training in the specialized field of public health is only one qualification for carrying on an effective public health job. A new employee's previous work experience often assists in equipping him for his duties. Furthermore, consistency of employment in public health may be some index of the degree to which the field is chosen as a profession rather than accepted as a job to be left if some other opportunity offers itself.

For these reasons, the present survey requested data on the employment experience of each individual. The items on the questionnaire included: (*a*) Title of each position held; (*b*) name and address of each employing organization; (*c*) number of years employed; (*d*) whether each position was held full-time or part-time; and (*e*) type of employing organization, that is, official health department (specifying State, county, or city), voluntary health agency, or other type. However, inasmuch as "number of years employed" rather than dates of employment was reported, it is sometimes impossible to check the precise sequence of periods of employment. Furthermore, upon preliminary examination of the schedules, it appeared that some physicians had failed to give employment history for the entire period of their availability for employment. Accordingly, each schedule was examined to determine the completeness with which employment experience had been reported.

In the examination, it was assumed that a physician had graduated from medical school and completed his interneship by the time he was 28 years old and, for the remaining years, was available for employment. The employment history was arbitrarily considered adequate if the discrepancy in length of employment reported was less than 5 years of "employable" time.

Schedules classified as reporting incomplete employment history were returned to the field for revision. However, approximately a fifth (22.5 percent) of the revised schedules were still lacking in the complete facts of employment history, if the criterion described above is valid. Further inspection of schedules with incomplete data indi-

cated that a large proportion of them had reported only public health employment. It is significant that, judging by the criteria described above, over a third of the city physicians returned schedules with inadequate information. In the other two types of jurisdictions the proportion was one out of five. Half the nonmedical health officers failed to report sufficient employment. Inasmuch as all but one of them are in city health departments, it follows that data on city employees are far less complete than those for the other jurisdictions.[10] Although it was impracticable to keep the incomplete schedules separate in the analysis, the lack of completeness in employment history must be kept constantly in mind in interpreting the material.

TYPES OF EXPERIENCE

Types of experience reported in fields other than public health are shown in table 8. Practically all experience reported by medical workers has been of a strictly medical character. It is also significant that, inasmuch as more than half of all health department physicians have had one or more years of private practice before entering public health, the majority of public health physicians in official agencies have had the opportunity to learn the point of view of the private practitioner. Approximately one out of seven reports having been a resident physician, but the manner in which residencies and internships were reported makes it difficult to determine in any given instance which is the correct interpretation. A few of the medical personnel have had business experience; 19 have previously been educators, and 10 have had laboratory experience.

TABLE 8.—*Types of experience reported by medical personnel in health departments*

Type of experience	All physicians		Medical health officers		Administrative physicians		Staff physicians	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total	1,956	100.0	947	100.0	579	100.0	430	100.0
Public health only	410	21.0	193	20.4	110	19.0	107	24.9
Other than public health [1]	1,546	79.0	754	79.6	469	81.0	323	75.1
Private practice	1,030	52.7	562	59.3	300	51.8	168	39.1
City, county, or clinic physician	125	6.4	46	4.9	47	8.1	32	7.4
Instructor in medical school	49	2.5	14	1.5	24	4.1	11	2.6
Resident	290	14.8	93	9.8	122	21.1	75	17.4
All other	313	16.0	144	15.2	82	14.2	87	20.2

[1] Combinations are not shown, but numbers and percentages are shown for each type of experience reported.

The employment history of nonmedical health officers is so widely varied that it cannot conveniently be incorporated into the table; for example, 7 reported managerial experience, 4 have been office workers,

[10] A part of the failure to report complete employment may be due to failure to report periods of unemployment. The present analysis makes no provision for this possibility.

and 3 have had experience in education. Furthermore, it should be recalled that half of the group obviously did not report complete employment history.

LENGTH OF MEDICAL PRACTICE

Since medical practice, either in an institution or as a private physician, was the experience most often reported, the length of such experience for the several categories of physicians is shown in table 9. The wide variability in the amount of experience in medical practice is the outstanding feature of the table. A few physicians have had as many as 40 years of such experience and the average for the entire group reporting medical practice is over 10 years. One-third of the group either failed to report any medical practice or had had no such experience. These physicians probably chose public health as a career and began work in it immediately after their interneship. On the other hand, some with very long experience in the practice of medicine are believed to have continued part-time practice while serving as whole-time public health workers. In the absence of dates of employment on the schedules and with no adequate criteria to guide in deciding such cases, distributions given in the table are based on reports as submitted. Health officers average 12 years of medical experience, but the other groups average 3 years less. Relatively fewer of the staff physicians than of the other groups report private practice.

TABLE 9.—*Length of experience in medical practice, exclusive of public health work, among public health physicians*

Years of private practice [1]	All physicians	Medical health officers	Administrative physicians	Staff physicians
	Number			
Total persons	1,956	947	579	430
Total reporting private practice	1,236	620	380	236
0–4	340	228	201	111
5–9	205	103	61	41
10–14	163	81	44	38
15–19	101	61	22	18
20–24	82	49	23	10
25–29	75	47	18	10
30–34	39	28	6	5
35–39	22	15	5	2
40 or more	9	8		1
Average, years	10.6	12.3	8.7	9.1
None reported	720	327	199	194
	Percentage			
Total persons	100.0	100.0	100.0	100.0
Total reporting private practice	63.2	65.5	65.6	54.9
0–4	27.6	24.1	34.7	25.8
5–9	10.5	10.9	10.5	9.5
10–14	8.3	8.5	7.6	8.9
15–19	5.2	6.4	3.8	4.2
20–24	4.2	5.2	4.0	2.3
25–29	3.8	5.0	3.1	2.3
30–34	2.0	3.0	1.0	1.2
35–39	1.1	1.6	0.9	0.5
40 or more	0.5	0.8		0.2
None reported	36.8	34.5	34.4	45.1

[1] Includes residencies, if definitely identifiable as such.

PUBLIC HEALTH EXPERIENCE

It has previously been pointed out that a number of physicians in health departments reported only their present positions and an additional number reported only positions in public health. Judging largely from the results of the attempt made to secure more complete data, it is safe to say that public health experience was more completely reported than any other type of prior employment. Since every person returning a schedule was employed by a public health department, all will, by definition, report some public health experience. The length of that experience is shown in table 10. This table has been arranged to show the distinctly jurisdictional character of differences in length of employment. Approximately half the physicians have had less than 5 years of public health experience and the city health department employees have been in the field longer than those in other jurisdictions. The low average for State and county employees is accounted for in some measure by the recent increase in employment in those jurisdictions. Here again, we see the effect of the Social Security Act on public health.

The White House Conference survey also obtained data on the public health experience of the 691 physicians studied. As of 1930, physicians in public health reported an average experience of 8.7 [11] years in public health work as compared to the present average of 8.2 years. Mountin and Pennell in their study of Tenure of Office for Health Officers [12] report the median years of experience as 3.4. However, their data are not directly comparable with the present study, inasmuch as they included not only currently employed health officers but also those whose tenure had terminated.

TABLE 10.—*Number of years of public health experience* [1] *reported by health officers and other medical personnel*

Years of experience in public health	All physicians		State employees		County employees		City employees		Nonmedical health officers	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total	1,956	100.0	487	100.0	951	100.0	518	100.0	89	100.0
0–4	954	48.8	268	55.0	507	53.3	179	34.6	15	16.9
5–9	367	18.8	89	18.3	170	17.9	108	20.9	18	20.2
10–14	296	15.1	55	11.3	159	16.7	82	15.8	21	23.6
15–19	172	8.8	36	7.4	71	7.5	65	12.5	8	9.0
20–24	93	4.7	22	4.5	27	2.8	44	8.5	13	14.6
25–29	43	2.2	9	1.9	12	1.3	22	4.2	8	9.0
30 or more	31	1.6	8	1.6	5	.5	18	3.5	6	6.7
Average	8.2	------	7.5	------	7.2	------	10.8	------	14.4	------

[1] Including present position.

[11] This takes into account only 651 out of the 691 whose experience was reported. Forty did not report number of years.

[12] Tenure of Office for Health Officers, by Joseph W. Mountin and Elliott Pennell. Am. J. Pub. Health, 28: 1311–1318 (November 1938).

VARIETY OF EXPERIENCE

In considering the qualifications of a health department employee in terms of his previous experience, one must take into account not only the length of his experience in the field, but also the extent to which he has had a variety of employment that would give him a better understanding of the scope of public health. Of course, in some instances shifting from place to place, or from one agency to another, may indicate that the employee has been unsatisfactory. On the other hand, employment in several localities or in different agencies will, through acquainting him with a variety of problems and administrative practices, broaden his vision and stimulate professional development.

From the reported material, it was possible to obtain two indexes of the variety of experience which the medical personnel in public health have had, i. e., number of public health positions held and experience in other States. In addition to those reporting only the present position, 410 health officers (43 percent of the total), 215 administrative physicians (37 percent), and 240 staff physicians (56 percent) reported their present work in public health as their only public health positions. In all, then, a total of 1,051 physicians (nearly 54 percent of the total) and 60 of the 89 nonmedical health officers have only whatever public health experience they have gained in one jurisdiction. The complete distribution of the number of public health positions held appears in table 11. It is interesting to note that a larger percentage of administrative physicians than of either of the other groups have had more than one position in public health. This may indicate a tendency for health officers to select experienced administrative co-workers even though they themselves may not have had a variety of experience.

TABLE 11.—*Number of positions in public health reported by health officers and other medical personnel*

Number of public health positions reported	All physicians		Medical health officers		Administrative physicians		Staff physicians		Nonmedical health officers	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total	1,956	100.0	947	100.0	579	100.0	430	100.0	89	100.0
1[1]	1,051	53.7	490	51.8	246	42.5	315	73.3	60	67.4
2	416	21.3	218	23.0	131	22.6	67	15.6	15	16.9
3	222	11.4	107	11.3	86	14.8	29	6.7	10	11.3
4	129	6.6	60	6.3	58	10.0	11	2.6	2	2.2
5	71	3.6	33	3.5	34	5.9	4	.9		
6	32	1.6	17	1.8	11	1.9	4	.9	1	1.1
7	23	1.2	15	1.6	8	1.4			1	1.1
8 or more	12	.6	7	.7	5	.9				

[1] Includes those reporting only present employment.

It might be pointed out that only four of the nonmedical health officers have had more than three positions in public health. Apparently, in addition to being untrained basically, the great majority of nonmedical health officers have had little or no experience aside from their present positions.

Although fewer than half of the medical personnel have had more than one position in public health, the number who have had experience in other States is much smaller. One physician out of five has worked in more than one State but only one in twenty has worked in as many as three States. Only two of the nonmedical health officers have worked in any State other than the one in which they are now employed.

In view of the limited training of medical workers in public health, their restricted experience would seem to be a handicap to a broad understanding of the public health problem and the ways of meeting it.

STABILITY OF PUBLIC HEALTH EMPLOYMENT

Stability of employment in any profession, and particularly in a field like public health, is an important consideration, not only for the employee but also from the point of view of the public and efficiency of service. Employees do not wish to spend time, money, and effort in training for a specialized type of work if the chance of remaining in it, i. e., job security, is extremely small. This does not mean that one should expect to hold a given position indefinitely; but, rather, that the field should offer opportunities and chance for advancement. From the point of view of efficiency a rapidly changing personnel is undesirable since it renders poor service. The primary reason for this is that in a profession such as public health, it takes time to establish a program and set it into effective operation. A change in personnel usually means a corresponding change in procedures and readjustment of routine practices with interruption to, or diminution of, service. Furthermore, if the employing organization, in this case the health department, is known to have a high rate of personnel turn-over, it finds itself unable to secure good employees who, if they are trained and experienced, expect stability.

The schedules in this survey do not provide complete data on stability since they cover the experience of workers now in health departments but do not, as has previously been pointed out, contain any information on those who have left the field.[13] Nevertheless, two indexes of stability of employment are available in the data. First of all, there are the reports on length of employment in the present position. The average for all physicians is 6.4 years. City health department physicians have been in their present positions longer

[13] It is recognized that a relatively limited number of physicians in public health are affiliated with nonofficial agencies, and that some health department physicians who leave official agencies remain in public health work.

than any other group. The average for physicians employed by city departments is 9.3 years, although two-fifths of them have been employed less than 5 years. Staff physicians, the majority of whom are in the cities, have likewise had longer employment in their present positions (7.8 years) than either State or county workers (5.4 and 5.3 years, respectively). Admittedly, the interpretation of these figures must be conditioned by the fact that expansion in public health departments during the past 5 years has been taking place chiefly in State and county units rather than in cities, thus decreasing the average in these two types of jurisdictions. This measure of stability is not entirely adequate in that the employment is continuing and there is no way of estimating its probable future.

A more important measure of stability from the point of view of the individual considering public health as a prospective profession is the possibility of his remaining continuously in the field after entering it, even though he may not stay in any one position for an extended period of time.

Tabulation of the number of periods of full-time employment outside the field of public health but subsequent to the first public health employment reported (see table 12) gives the measure of stability referred to.[14] Out of every six physicians now in official

TABLE 12.—*Periods of full-time employment not in public health after first public health employment reported by health officers and other medical personnel*

Periods of full-time employment not in public health after entering the field	All physicians		Medical health officers		Administrative physicians		Staff physicians		Nonmedical health officers	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total individuals	1,956	100.0	947	100.0	579	100.0	430	100.0	89	100.0
None, present position only reported	186	9.5	80	8.4	31	5.4	75	17.4	19	21.3
All employment in public health	1,504	76.9	737	77.9	460	79.5	307	71.4	66	74.2
1	149	7.6	73	7.7	54	9.3	22	5.1	4	4.5
2	64	3.3	36	3.8	10	1.7	18	4.2	-------	-------
3	34	1.7	15	1.6	15	2.6	4	.9	-------	-------
4	13	.7	4	.4	7	1.2	2	.5	-------	-------
5 or more	6	.3	2	.2	2	.3	2	.5	-------	-------
Percentage of employment (years) not in public health	-------	48.7	-------	52.4	-------	46.7	-------	41.3	-------	43.1

health departments, five have remained continuously in public health work since their first employment in it. The proportion of physicians who report having any other kind of work after they had their first public health position is only 14 percent of the total and is only 15

[14] It has been pointed out that the schedule did not permit exact determination of the continuity of employment, particularly if periods of unemployment (which were usually not reported) intervened. However, following the reasonable assumption that the reporting of employment was according to instructions and followed the order of employment, the above determinations are valid.

percent even among administrative physicians who have had the most varied experience. It appears quite clearly, therefore, that the majority of physicians now in health departments have enjoyed occupational stability in the field of public health. This coincides with the findings of Mountin and Pennell's study previously cited that physicians beginning public health work either continue in the field without interruption or leave within a very short time.

SUMMARY AND DISCUSSION

An analysis of the training and experience of health officers and other medical personnel from questionnaires submitted by the workers leads to the following conclusions:

1. Public health departments have employed and retained a large proportion of workers who came into the field of public health without previous experience or specialized training for it.

2. Basic academic training of the majority of the physicians in public health is up to the standard currently recommended by the profession and that of the administrative physicians is better than that of health officers or staff physicians. County and State employees have more training than those in cities.

3. Perhaps because of recent rapid expansion in public health, and a scarcity of adequately trained candidates for the new positions, there has developed a tendency to employ young physicians and train them after they begin work. If the general level of training among employees in health departments is to be raised, either of two courses of action can be taken: (*a*) Institute a more intensive graduate public health training program so that a sufficient number of candidates for employment will be available; or (*b*) continue the present system of in-service training.

4. Physicians now in health departments have had little variety of experience either in other localities than the one in which they are now working or in other official or nonofficial agencies. If it is desired to have, especially in the larger State departments, a mobile corps of men adaptable to all situations, this fact may indicate the need for a change of administrative or employment policy.

5. The problem of employee replacement, especially in cities, will be a serious one in the next 10 years, due largely to the death or retirement of older physicians now in service. Although city workers now have less public health training than those in other jurisdictions, future employment may raise the level of public health training in city jurisdictions.

DISABLING MORBIDITY AMONG INDUSTRIAL WORKERS, THIRD QUARTER OF 1940, WITH OBSERVATIONS ON INFLUENZA, BRONCHITIS, AND PNEUMONIA, 1931–40 [1]

By WILLIAM M. GAFAFER, *Senior Statistician, United States Public Health Service*

The data on the frequency of sickness and nonindustrial injuries causing disability for 8 consecutive calendar days or longer during the third quarter and the first 9 months of 1939 and 1940, presented in table 1, are derived from analyses of periodic reports from industrial sick benefit organizations comprising mutual sick benefit associations, group insurance plans, and company relief departments. More than 170,000 male workers are represented, employed in plants located in Pennsylvania, Illinois, Massachusetts, Connecticut, New York, Ohio, Maine, South Dakota, New Jersey, and Canada.

TABLE 1.—*Frequency of disabling cases of sickness and nonindustrial injuries lasting 8 consecutive calendar days or longer among* MALE *employees in various industries, by cause, the third quarter of 1940 compared with the third quarter of 1939, and the first 9 months of 1940 compared with the first 9 months of the years 1935–39, inclusive*

Cause (numbers in parentheses are disease title numbers from the International List of Causes of Death, 1939)	Annual number of cases per 1,000 males				
	Third quarter		First 9 months		
	1940	1939	1940	1939	1935–39
Sickness and nonindustrial injuries [1]	77.2	70.8	100.3	92.8	92.2
Nonindustrial injuries (163–198)	11.8	11.2	11.7	10.2	11.1
Sickness [1]	65.4	59.6	88.6	82.6	81.1
Respiratory diseases	20.7	14.7	46.7	36.4	34.3
Influenza and grippe (33)	6.3	4.0	19.2	18.7	16.5
Bronchitis, acute and chronic (106)	3.8	2.3	5.6	4.0	4.3
Diseases of the pharynx and tonsils (part of 115)	3.6	3.3	5.2	4.7	5.0
Pneumonia, all forms (107–109)	1.7	1.1	3.9	3.0	2.6
Tuberculosis of the respiratory system (13)	.7	.6	.7	.8	.9
Other respiratory diseases (104, 105, 110–114)	4.6	3.4	6.1	5.2	5.0
Nonrespiratory diseases	42.0	42.9	45.7	44.1	44.2
Digestive diseases	13.9	14.6	14.7	14.1	13.8
Diseases of the stomach except cancer (117, 118)	3.8	3.3	3.9	3.6	3.8
Diarrhea and enteritis (120)	1.4	1.5	1.4	1.3	1.3
Appendicitis (121)	4.9	5.0	5.2	4.5	4.3
Hernia (part of 122)	1.3	1.7	1.5	1.6	1.6
Other digestive diseases (part of 115 and 122, 116, 123–129)	2.5	3.1	2.7	3.1	2.8
Nondigestive diseases	28.1	28.3	31.0	30.0	30.4
Diseases of the heart and arteries, and nephritis (90–99, 102, 130–132)	3.7	3.7	4.4	4.4	4.1
Other genitourinary diseases (133–138)	2.5	2.6	2.6	2.4	2.4
Neuralgia, neuritis, sciatica (part of 87)	1.8	2.1	2.5	2.2	2.2
Neurasthenia and the like (part of 84)	1.1	.8	1.1	.9	1.1
Other diseases of the nervous system (80–83, 85, 86, part of 84 and 87)	.7	1.2	1.0	1.1	1.1
Rheumatism, acute and chronic (58, 59)	3.6	2.6	4.2	3.6	4.1
Diseases of the organs of locomotion, except diseases of the joints (part of 156)	2.5	2.4	2.9	2.6	2.8
Diseases of the skin (151–153)	3.2	3.4	2.9	2.8	3.0
Infectious and parasitic diseases [2] (1–12, 14–24, 26–29, 31, 32, 34–44)	1.9	1.8	2.0	2.4	2.6
All other diseases (45–57, 60–79, 88, 89, 100, 101, 103, 154, 155, part of 156, 157, 162)	7.1	7.7	7.4	7.6	7.0
Ill-defined and unknown causes (200)	2.7	2.0	2.2	2.1	2.6
Average number of males covered in the record	202,209	176,671	195,628	172,821	163,649
Number of organizations	25	26	25	26	

[1] Exclusive of disability from the venereal diseases and a few numerically unimportant causes of disability.
[2] Except influenza, respiratory tuberculosis, and the venereal diseases.

[1] From the Division of Industrial Hygiene, National Institute of Health. The report for the second quarter appeared in Public Health Reports, vol. 55, pp. 2127–2130, November 15, 1940.

Interest in table 1 centers chiefly on the increase in the number of workers exposed, and on the increases during the third quarter in rates for certain causes of the respiratory group of diseases. These causes, bronchitis (acute and chronic), influenza and grippe, and pneumonia (all forms), show increases of 65 percent, 57 percent, and 55 percent, respectively.

TABLE 2.—*Frequency of disabling cases of influenza and grippe, bronchitis, and pneumonia lasting 8 consecutive calendar days or longer among* MALE *employees in various industries, the third quarters of 1931–40, inclusive*

Year in third quarter of which onset of disability occurred	Rate or average annual number of cases per 1,000 employees			Ratio of rate to rate for 1931–40		
	Influenza and grippe	Bronchitis, acute and chronic	Pneumonia, all forms	Influenza and grippe	Bronchitis, acute and chronic	Pneumonia, all forms
1931–40 (mean)	4.6	2.7	1.1	1.00	1.00	1.00
1931	4.4	2.6	.7	.96	.96	.64
1932	4.9	2.3	.9	1.07	.85	.82
1933	4.3	2.3	.8	.93	.85	.73
1934	4.2	2.1	.9	.91	.78	.82
1935	4.1	2.8	1.1	.89	1.04	1.00
1936	4.4	2.7	.9	.96	1.00	.82
1937	5.2	3.1	1.6	1.13	1.15	1.45
1938	4.4	2.6	1.3	.96	.96	1.18
1939	4.0	2.3	1.1	.87	.81	1.00
1940	6.3	3.8	1.7	1.37	1.41	1.55

Influenza, bronchitis, and pneumonia, 1931–40.—An examination of the third quarter frequency rates and ratios yielded by influenza, bronchitis, and pneumonia for the past 10 years, 1931–40, shown in table 2, discloses a number of noteworthy relationships: (1) For any particular year the third quarter rates, when set down in decreasing order of magnitude, show influenza ranking first, bronchitis, second, and pneumonia, third; (2) for each cause the third quarter rate for 1940 is the highest, and is most closely approached by the third quarter rate for 1937; (3) when the third quarter rate for 1940 for each of the 3 causes is related to the corresponding average rate yielded by all 10 third quarters, it is found that the percentage excesses for pneumonia, bronchitis, and influenza are 55 percent, 41 percent, and 37 percent, respectively; (4) the greatest variability about the average derived from the 10 third quarter rates is shown by pneumonia while the corresponding variabilities for influenza and bronchitis are less and similar to each other; and (5) the trend of the 10 third quarter rates for each of the 3 causes appears to be increasing, pneumonia showing the most rapid rate of increase and influenza, the least. Thus, the third quarter of 1940 yielded abnormally high frequencies for influenza, bronchitis, and pneumonia; in fact, these third quarter frequencies are the highest that have been experienced for these causes since 1931. It is at present too early to state with any degree of assurance that the phenomenon is principally related to the increase in the number of workers exposed.

COURT DECISION ON PUBLIC HEALTH

Filled-milk law construed.—(Missouri Supreme Court; *State ex rel. McKittrick, Atty. Gen.*, v. *Carolene Products Co.*, 144 S.W.2d 153; decided September 3, 1940.) Section 12408 of the Missouri Statutes Annotated, among other things, prohibited the sale of milk, skim milk, etc., to which had been added any fat or oil other than milk fat. Section 12413 was similar to section 12408 except that the former did not name emulsified cream, which was not involved in the instant case. Section 12409 defined "filled milk" to mean "any milk, cream, or skim milk * * * to which has been added, or which has been blended or compounded with, any fat or oil other than milk fat, so that the resulting product is in imitation or semblance of milk, cream, or skim milk * * * which has been melted or refined by heating, boiling, or mixing." Distinctive proprietary food compounds meeting certain conditions were excepted from such definition. Section 12413 was a part of one law, while sections 12408 and 12409 were a part of another law which was enacted at the same session as and approved three days later than the first law.

In construing these statutory provisions the Supreme Court of Missouri said that sections 12408 and 12413 were general statutes dealing with milk to which had been added fat or oil other than milk fat and that section 12409 dealt with the same subject in a more minute and definite way. The latter, it was said, being special would prevail over the two former sections. The court then concluded that, considering the statutes dealing with the subject as a whole, the intent of the legislature was to prohibit the sale of filled milk, that filled milk was only that milk to which had been added fat or oil other than milk fat "so that the resulting product is in imitation or semblance of milk, cream, or skim milk," and that if the product did not come within the statutory definition of filled milk it could be lawfully sold in the State.

DEATHS DURING WEEK ENDED DECEMBER 14, 1940

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Dec. 14, 1940	Corresponding week, 1939
Data from 88 large cities of the United States:		
Total deaths	8,648	8,432
Average for 3 prior years	8,641	
Total deaths, 50 weeks of year	418,616	412,011
Deaths under 1 year of age	567	464
Average for 3 prior years	509	
Deaths under 1 year of age, 50 weeks of year	25,229	24,788
Data from industrial insurance companies:		
Policies in force	64,791,753	66,440,030
Number of death claims	11,293	12,215
Death claims per 1,000 policies in force, annual rate	9.1	9.6
Death claims per 1,000 policies, 50 weeks of year, annual rate	9.6	9.8

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED DECEMBER 21, 1940

Summary

Official reports from the State health officers show 48,528 cases of influenza for the week ended December 21, as compared with 29,864 for the preceding week. The current report showed the highest weekly incidence of influenza since the 1932–33 epidemic when a peak of 90,000 cases was reached during the week ended December 31, 1932. The next highest preceding peak week was on January 5, 1929, when 196,000 cases were reported.

The principal increases for the current week were noted in Louisiana (from 321 to 8,000), Washington (from 914 to 3,796), Oregon (from 978 to 2,645), Nevada (from 430 to 1,000), Wyoming (from 4 to 1,085), Arkansas (from 234 to 2,191), Indiana (from 213 to 979), and Texas (from 671 to 7,307), while slight decreases were indicated in California, Utah, Arizona, and Idaho.

The reports state generally that the disease is of a mild type with no appreciable increase in pneumonia cases or mortality as a result of the outbreak.

In regard to the other common communicable diseases, conditions were generally favorable throughout the country with decreases indicated in the incidence of diphtheria, meningitis, poliomyelitis, scarlet fever, smallpox, typhoid fever, and whooping cough.

For the current week the Bureau of the Census reports 8,697 deaths in 88 major cities of the United States as compared with 8,648 for the preceding week and with a 3-year (1937–39) average of 8,583 for the corresponding week.

Telegraphic morbidity reports from State health officers for the week ended December 21, 1940, and comparison with corresponding week of 1939 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none were reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended		Median, 1935–39	Week ended		Median, 1935–39	Week ended		Median, 1935–39	Week ended		Median, 1935–39
	Dec. 21, 1940	Dec. 23, 1939		Dec. 21, 1940	Dec. 23, 1939		Dec. 21, 1940	Dec. 23, 1939		Dec. 21, 1940	Dec. 23, 1939	
NEW ENG.												
Maine	0	4	4	3		1	37	46	46	1	0	0
New Hampshire	0	0	0	2			4	2	9	0	0	0
Vermont	0	0	0				37	25	25	0	0	0
Massachusetts	1	5	5				294	178	195	3	0	1
Rhode Island	0	0	0	1			0	51	51	0	0	0
Connecticut	0	0	6	2	3	3	6	97	76	0	0	0
MID ATL.												
New York	20	26	26	[1]41	[1]15	[1]14	1,194	395	395	4	1	5
New Jersey	8	9	9	4	8	8	336	13	20	0	0	0
Pennsylvania	17	44	55				1,121	66	67	1	9	6
E. NO. CEN.												
Ohio	5	17	18	12	8	8	42	8	22	2	1	3
Indiana	8	22	22	979	14	25	33	1	8	0	0	1
Illinois	17	39	39	23	14	25	669	21	21	0	0	4
Michigan [2]	7	5	11	2	5	1	780	206	206	1	0	1
Wisconsin	0	0	1	42	24	55	330	88	83	0	0	0
W. NO. CEN.												
Minnesota	1	0	3	1	3		29	31	31	0	0	0
Iowa	3	10	10	8	3	5	133	69	9	0	0	0
Missouri	10	23	22	6	5	60	15	6	7	3	1	1
North Dakota	3	0	1	52	26	3	12	2	2	1	0	0
South Dakota	4	4	4		2	1	1	3	2	0	0	0
Nebraska	0	0	2				8	1	3	0	0	0
Kansas	3	5	6	269	283	4	70	120	10	1	3	2
SO. ATL.												
Delaware	2	0	0				25	5	5	0	0	0
Maryland [2]	0	11	11	4	8	12	1	1	41	0	0	3
Dist. of Col	4	1	6	3	1	1	3	2	3	1	0	0
Virginia	10	15	30	203	33		41	4	46	2	0	3
West Virginia [2]	12	9	11	38	15	43	6	5	12	1	4	3
North Carolina [2]	28	48	39	[1]0	44	12	31	145	145	2	0	1
South Carolina [2]	4	7	3	315	1,638	236	21	1	3	0	1	1
Georgia [2]	7	15	15	178	975	88	18	9	0	0	0	0
Florida	3	4	11	28	11	6	2	0	3	0	0	2
E. SO. CEN.												
Kentucky	3	9	12	184	4	31	195	1	32	1	0	3
Tennessee	11	14	14	52	99	50	29	43	14	0	3	3
Alabama [2]	11	9	18	222	398	156	61	8	8	2	0	1
Mississippi [2]	5	9	5							1	0	1
W. SO. CEN.												
Arkansas	5	16	7	2,191	79	52	28	0	3	0	0	0
Louisiana [2]	3	11	11	8,000	1	12	1	1	2	1	0	0
Oklahoma	15	5	19	1,369	119	80	0	2	9	0	1	3
Texas [2]	40	84	74	7,307	597	493	46	85	72	3	2	2
MOUNTAIN												
Montana	0	0	1	106	306	22	1	14	14	0	1	0
Idaho	0	0	0	51		2	3	2	13	0	1	0
Wyoming	0	1	1	1,085	1		1	12	2	0	0	0
Colorado	4	11	11	47	245	1	79	24	12	0	3	0
New Mexico	1	2	4	27	2	2	66	5	16	0	0	0
Arizona	2	6	4	1,006	75	76	38	3	2	0	0	0
Utah [2]	0	0	0	5,133	688		3	61	38	0	0	1
Nevada				1,000								
PACIFIC												
Washington	0	1	2	3,796			182	418	146	2	0	1
Oregon	3	2	1	2,645	100	39	5	37	13	0	0	1
California	5	22	33	12,081	131	40	53	190	190	0	0	3
Total	285	525	543	48,528	5,997	1,634	6,090	2,502	2,845	33	30	81
51 weeks	15,417	23,589	28,211	270,265	182,255	155,735	269,665	372,517	372,517	1,582	1,931	5,307

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended December 21, 1940, and comparison with corresponding week of 1939 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended		Median, 1935–39	Week ended		Median, 1935–39	Week ended		Median, 1935–39	Week ended		Median, 1935–39
	Dec. 21, 1940	Dec. 23, 1939		Dec. 21, 1940	Dec. 23, 1939		Dec. 21, 1940	Dec. 23, 1939		Dec. 21, 1940	Dec. 23, 1939	
NEW ENG.												
Maine	0	1	0	19	16	16	0	0	0	1	1	1
New Hampshire	0	0	0	6	0	7	0	0	0	0	0	0
Vermont	0	0	0	11	7	7	0	0	0	0	0	0
Massachusetts	0	2	0	145	88	178	0	0	0	0	0	1
Rhode Island	0	0	0	2	3	28	0	0	0	0	0	0
Connecticut	0	0	0	33	61	57	0	0	0	2	1	1
MID. ATL.												
New York	1	1	1	284	353	353	0	0	0	19	8	8
New Jersey	0	2	0	137	113	103	0	0	0	0	2	1
Pennsylvania	1	2	1	218	276	387	0	0	0	7	9	9
E. NO. CEN.												
Ohio	2	1	1	167	231	264	1	1	2	3	3	3
Indiana	2	0	0	84	108	133	1	5	6	1	0	3
Illinois	3	1	1	334	323	423	6	0	2	4	1	5
Michigan [3]	5	2	1	182	294	344	5	0	1	1	2	2
Wisconsin	10	3	0	127	130	188	6	1	6	0	3	1
W. NO. CEN.												
Minnesota	2	1	1	78	119	119	17	19	15	1	0	1
Iowa	2	4	0	70	72	132	2	5	15	1	0	1
Missouri	0	0	0	79	128	128	2	1	4	6	4	4
North Dakota	0	0	0	12	22	22	1	0	3	0	0	0
South Dakota	1	1	1	17	4	18	2	5	5	0	1	0
Nebraska	2	2	0	27	16	27	1	3	1	0	0	0
Kansas	0	0	1	82	104	125	0	0	7	0	0	1
SO. ATL.												
Delaware	1	0	0	18	24	19	0	0	0	0	0	0
Maryland [3]	1	1	0	39	46	49	0	0	0	0	3	3
Dist. of Col.	0	0	0	7	10	10	0	0	0	1	1	1
Virginia	3	1	1	17	31	35	0	0	0	3	2	4
West Virginia [3]	3	6	1	41	73	73	0	0	0	2	0	2
North Carolina [3]	0	1	0	87	68	53	0	0	0	2	1	1
South Carolina [3]	0	0	0	10	11	6	0	0	0	0	1	1
Georgia [3]	0	0	0	16	44	21	0	0	0	6	6	6
Florida	0	0	0	1	8	8	0	0	0	0	0	0
E. SO. CEN.												
Kentucky	0	2	0	59	54	60	0	0	0	2	2	2
Tennessee	0	0	1	58	93	41	0	1	0	2	2	2
Alabama [3]	1	0	1	25	21	21	0	2	1	1	0	3
Mississippi [3]	0	0	0	9	6	8	0	0	0	0	0	1
W. SO. CEN.												
Arkansas	0	2	0	5	19	13	0	4	0	3	3	2
Louisiana [3]	3	0	1	20	11	12	0	0	0	16	3	6
Oklahoma	0	4	2	24	23	36	2	5	1	0	0	2
Texas [3]	2	4	1	69	84	84	1	5	4	6	22	16
MOUNTAIN												
Montana	0	0	0	30	30	30	0	1	21	0	0	0
Idaho	0	0	0	9	5	21	0	0	0	1	0	1
Wyoming	0	0	0	11	16	12	0	0	3	0	1	0
Colorado	0	2	0	17	50	50	1	46	7	0	0	1
New Mexico	0	1	0	7	27	27	0	0	0	3	3	3
Arizona	0	2	0	1	4	9	0	0	0	1	0	0
Utah [3]	1	1	0	6	15	23	0	2	0	0	0	0
Nevada												
PACIFIC												
Washington	1	0	0	38	54	49	0	0	1	0	0	1
Oregon	1	0	0	7	20	43	0	0	6	0	1	2
California	1	8	6	68	142	190	0	4	8	5	8	6
Total	49	58	45	2,813	3,457	4,137	48	110	163	102	89	106
51 weeks	9,734	7,261	7,261	152,462	158,500	218,448	2,402	9,456	9,456	9,507	12,630	14,486

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended December 21, 1940, and comparison with corresponding week of 1939 and 5 year median—Con.

Division and State	Whooping cough	
	Week ended	
	Dec. 21, 1940	Dec. 23, 1939
NEW ENG.		
Maine	19	14
New Hampshire	7	7
Vermont	18	35
Massachusetts	274	74
Rhode Island	4	15
Connecticut	81	67
MID. ATL.		
New York	410	351
New Jersey	162	82
Pennsylvania	571	250
E. NO. CEN.		
Ohio	192	51
Indiana	10	22
Illinois	171	71
Michigan [3]	285	111
Wisconsin	128	137
W. NO. CEN.		
Minnesota	70	42
Iowa	22	12
Missouri	51	20
North Dakota	11	2
South Dakota	12	0
Nebraska	9	2
Kansas	64	13
SO. ATL.		
Delaware	39	4
Maryland [2]	66	49
Dist. of Col	13	7
Virginia	71	23
West Virginia [2]	34	28
North Carolina [3]	239	36
South Carolina [3]	29	19
Georgia [3]	13	10
Florida	3	4
E. SO. CEN.		
Kentucky	51	24
Tennessee	58	32
Alabama [3]	47	1
Mississippi [3]	----	----
W. SO. CEN.		
Arkansas	34	4
Louisiana [3]	5	28
Oklahoma	13	0
Texas [3]	160	106
MOUNTAIN		
Montana	3	6
Idaho	18	0
Wyoming	0	5
Colorado	40	11
New Mexico	15	42
Arizona	1	10
Utah [3]	11	40
Nevada	----	----
PACIFIC		
Washington	36	4
Oregon	12	26
California	149	84
Total	3,731	1,981
51 weeks	167,962	170,367

[1] New York City only.
[2] Period ended earlier than Saturday.
[3] Typhus fever, week ended December 21, 1940, 27 cases as follows: North Carolina, 1; South Carolina, 4; Georgia, 9; Alabama, 7; Louisiana, 1; Texas, 5.

WEEKLY REPORTS FROM CITIES

City reports for week ended December 7, 1940

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities:											
5-year average	184	174	48	818	603	1,177	13	339	27	1,046	----
Current week [1]	71	2,423	26	1,897	396	823	9	289	32	1,445	----
Maine:											
Portland	0	----	0	0	1	1	0	0	0	16	29
New Hampshire:											
Concord	0	----	0	0	2	0	0	0	0	0	11
Manchester	0	----	1	0	1	9	0	0	0	0	16
Nashua	0	----	0	0	0	1	0	0	0	0	7
Vermont:											
Barre	0	----	0	0	0	0	0	0	0	0	3
Burlington	0	----	0	0	0	0	0	0	0	0	10
Rutland	0	----	0	0	0	0	0	0	0	0	4
Massachusetts:											
Boston	1	----	0	52	15	49	0	7	0	127	233
Fall River	2	----	0	1	0	6	0	1	0	7	20
Springfield	0	----	0	0	3	2	0	0	0	5	41
Worcester	0	----	0	95	5	8	0	4	0	0	52
Rhode Island:											
Pawtucket	0	----	0	0	2	0	0	0	0	0	11
Providence	0	3	1	5	2	0	0	0	0	5	51
Connecticut:											
Bridgeport	0	----	0	0	4	5	0	1	0	1	36
Hartford	0	----	0	0	1	4	0	0	0	5	45
New Haven	0	----	0	0	0	9	0	0	0	13	34
New York:											
Buffalo	0	----	0	20	15	13	0	7	0	48	159
New York	13	3	0	412	44	121	0	51	9	122	1,366
Rochester	0	2	0	1	3	1	0	1	0	18	54
Syracuse	0	----	0	0	5	4	0	0	0	3	50
New Jersey:											
Camden	0	----	0	64	1	3	0	0	0	3	24
Newark	0	1	0	26	2	24	0	5	0	25	97
Trenton	0	1	0	0	3	14	0	0	0	4	45
Pennsylvania:											
Philadelphia	1	2	0	370	23	45	0	33	1	146	522
Pittsburgh	3	2	1	9	11	12	0	5	1	43	163
Reading	0	----	0	5	1	1	0	0	0	13	21
Scranton	0	----	----	1	----	0	0	----	0	1	----
Ohio:											
Cincinnati	1	----	0	1	8	11	0	3	0	2	131
Cleveland	0	23	3	11	11	23	0	3	0	66	189
Columbus	0	----	0	1	4	5	0	2	0	13	77
Toledo	0	----	0	2	2	8	0	1	0	15	64
Indiana:											
Anderson	0	----	0	0	2	2	0	0	0	0	6
Fort Wayne	0	----	0	0	3	0	0	0	0	0	29
Indianapolis	6	----	0	1	10	20	0	3	0	4	108
Muncie	0	----	0	0	0	3	0	0	0	1	17
South Bend	0	----	0	0	1	0	0	0	0	0	15
Terre Haute	1	----	0	0	1	0	0	1	1	0	11
Illinois:											
Alton	0	----	0	0	1	0	0	0	0	0	11
Chicago	6	4	1	394	22	119	0	38	1	66	729
Elgin	0	----	0	0	0	0	0	0	0	0	13
Moline	0	----	0	1	0	0	0	0	0	0	* 7
Springfield	0	----	1	0	4	13	0	0	0	5	30
Michigan:											
Detroit	1	2	0	317	16	70	0	8	2	124	245
Flint	0	----	0	2	5	2	0	1	0	13	30
Grand Rapids	0	----	1	8	3	3	0	0	0	31	41
Wisconsin:											
Kenosha	0	----	0	0	0	1	0	0	0	1	5
Madison	0	----	0	0	0	2	0	0	0	6	28
Milwaukee	0	----	0	30	0	28	0	3	0	84	82
Racine	0	----	0	4	0	2	0	0	0	0	11
Superior	0	----	0	0	0	3	0	0	0	6	7

[1] Figures for Boise estimated; report not received.

City reports for week ended December 7, 1940—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Minnesota:											
Duluth	0	------	0	0	0	2	9	0	0	5	19
Minneapolis	0	------	0	0	5	19	0	0	0	35	102
St. Paul	0	------	0	2	5	5	0	0	0	28	72
Iowa:											
Cedar Rapids	0	------	------	1	------	7	0	------	0	0	------
Davenport	0	------	------	0	------	3	0	------	0	0	------
Des Moines	1	------	0	1	0	20	0	0	1	0	37
Sioux City	0	------	------	0	------	3	0	------	0	0	------
Missouri:											
Kansas City	0	------	0	3	6	12	0	2	0	55	92
St. Joseph	0	------	0	0	1	1	0	1	0	0	29
St. Louis	7	1	0	4	7	23	0	5	0	27	238
North Dakota:											
Fargo	0	------	0	0	0	0	0	0	0	2	13
Grand Forks	0	------	------	0	------	0	0	------	0	0	------
Minot	0	------	0	0	0	0	0	0	0	0	8
South Dakota:											
Aberdeen	0	------	------	0	------	1	0	------	0	2	------
Sioux Falls	0	------	0	0	0	1	0	0	0	0	10
Nebraska:											
Lincoln	0	------	------	0	------	8	0	------	0	2	------
Omaha	0	------	0	0	4	6	0	4	0	2	64
Kansas:											
Lawrence	0	------	0	0	0	0	0	0	0	0	7
Topeka	0	------	0	0	3	3	0	0	0	1	21
Wichita	1	------	0	3	7	5	0	0	0	39	33
Delaware:											
Wilmington	0	------	0	3	0	4	0	0	0	10	25
Maryland:											
Baltimore	1	5	1	0	14	19	0	13	0	64	219
Cumberland	0	------	0	0	1	1	0	0	1	0	12
Frederick	0	------	0	0	0	0	0	0	0	0	4
Dist. of Columbia:											
Washington	3	------	0	0	6	15	0	11	0	14	148
Virginia:											
Lynchburg	0	------	0	0	3	0	0	0	0	0	15
Norfolk	0	11	0	7	4	4	0	1	0	1	14
Richmond	1	------	0	0	2	7	0	0	1	0	39
Roanoke	1	------	0	0	0	1	0	1	0	12	14
West Virginia:											
Charleston	0	------	0	0	0	0	0	1	1	0	20
Huntington	0	------	------	0	------	1	0	------	0	0	------
Wheeling	0	------	------	3	------	0	0	------	0	12	------
North Carolina:											
Gastonia	0	------	------	0	------	0	0	------	0	1	------
Raleigh	0	------	0	0	1	0	0	0	0	5	10
Wilmington	2	------	0	0	1	3	0	0	0	1	9
Winston-Salem	0	------	0	0	1	1	0	1	0	29	15
South Carolina:											
Charleston	0	15	0	7	2	1	0	0	0	0	25
Florence	0	45	0	0	1	0	0	0	0	3	20
Greenville	1	------	0	1	0	3	0	0	1	8	2
Georgia:											
Atlanta	0	12	0	2	0	4	0	7	4	3	82
Brunswick	0	------	0	0	0	2	0	0	0	0	4
Savannah	1	20	0	0	1	2	0	4	0	1	32
Florida:											
Miami	0	4	0	1	0	0	0	1	1	0	38
Tampa	0	------	0	0	0	0	0	2	0	0	17
Kentucky:											
Ashland	0	1	0	2	0	1	0	1	1	7	8
Covington	0	------	0	3	0	0	0	3	0	2	16
Lexington	0	------	0	49	3	0	0	2	0	8	20
Louisville	0	------	0	1	6	13	0	3	0	8	86
Tennessee:											
Knoxville	0	------	0	1	3	3	0	0	0	6	32
Memphis	1	------	0	4	1	2	0	2	1	0	76
Nashville	0	------	2	3	2	5	0	1	0	7	48
Alabama:											
Birmingham	0	4	1	8	3	9	0	4	0	0	52
Mobile	0	1	1	0	2	1	0	2	0	0	21
Montgomery	0	------	------	1	------	1	0	------	0	0	------
Arkansas:											
Fort Smith	0	------	------	0	------	1	0	0	0	0	------
Little Rock	0	5	0	0	3	1	0	0	0	0	26

City reports for week ended December 7, 1940—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Louisiana:											
Lake Charles	1		0	0	3	0	0	0	0	2	9
New Orleans	2	21	0	1	13	1	0	4	4	1	145
Shreveport	0		0	0	1	0	0	5	0	1	47
Oklahoma:											
Oklahoma City	1	20	1	0	6	5	0	1	0	0	58
Tulsa	5		0	0	5	2	0	1	0	15	36
Texas:											
Dallas	6		0	0	2	3	0	2	1	3	55
Fort Worth	0		0	2	3	10	0	1	0	13	38
Galveston	1		0	0	4	0	0	0	0	0	13
Houston	0		0	1	5	3	0	9	1	0	98
San Antonio	0	30	0	0	3	5	0	5	0	0	73
Montana:											
Billings	0		0	0	0	2	0	0	0	0	14
Great Falls	0		0	0	0	3	0	0	0	0	3
Helena	0		0	0	0	0	0	0	0	0	2
Missoula	0		0	0	0	1	0	1	1	0	10
Idaho:											
Boise											
Colorado:											
Colorado Springs	0		0	1	0	1	0	0	0	0	10
Denver	5		0	10	7	4	0	3	0	11	94
Pueblo	0		1	3	1	1	0	0	0	5	6
New Mexico:											
Albuquerque	0		0	0	1	0	0	2	0	2	12
Utah:											
Salt Lake City	0		2	0	8	3	0	1	0	2	43
Washington:											
Seattle	0		1	2	4	2	0	1	1	9	99
Spokane	0		1	0	3	0	0	0	0	0	30
Tacoma	0		0	3	1	0	0	1	0	4	37
Oregon:											
Portland	0	32	0	1	4	3	0	0	0	0	81
Salem	0	8		0		0	0		0	2	
California:											
Los Angeles	1	1,625	7	6	10	10	0	12	0	49	431
Sacramento	3	143	1	0	6	7	0	0	0	0	36
San Francisco	0	498	0	0	11	2	0	7	1	39	207

State and city	Meningitis, meningococcus		Poliomyelitis cases	State and city	Meningitis, meningococcus		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
New York:				South Carolina:			
Buffalo	2	1	0	Florence	1	0	0
New York	3	1	1	Texas:			
New Jersey:				Houston	0	1	1
Newark	1	0	1	Utah:			
Ohio:				Salt Lake City	0	0	1
Cleveland	0	0	1	California:			
Indiana:				Los Angeles	0	0	1
Indianapolis	0	0	3				

Encephalitis, epidemic or lethargic.—Cases: Baltimore, 1; Sacramento, 1.
Pellagra.—Cases: Charleston, S. C., 2; Savannah, 2; Montgomery, 2.
Typhus fever.—Cases: Charleston, S. C., 1; Atlanta, 1; Savannah, 1; Nashville, 2; Mobile, 2; New Orleans, 4; Shreveport, 1; Dallas, 1; Houston, 2.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended November 23, 1940.—During the week ended November 23, 1940, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis			1	3	3			1		8
Chickenpox		21	4	170	456	86	93	148	54	1,032
Diphtheria		36	2	36	1	3	10	1		89
Influenza		46			12	1			164	223
Measles		103	4	23	246	73	109	46	72	676
Mumps				64	102	55	3	13	13	250
Pneumonia		4			24	6		2	15	51
Poliomyelitis				2						2
Scarlet fever		16	1	113	135	9	11	11	22	318
Trachoma							1		7	8
Tuberculosis	1	7	7	35	66	3	1	2		122
Typhoid and paratyphoid fever		1	4	12	3	1	3			24
Whooping cough		29	1	248	151	22	19	34	14	518

CUBA

Provinces—Notifiable diseases—4 weeks ended November 9, 1940.—During the 4 weeks ended November 9, 1940, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana [1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	3		1	4		6	14
Diphtheria	2	17		1	2	4	26
Hookworm disease	1	16					17
Leprosy				1			1
Malaria	41	22		15	3	57	138
Measles		3					3
Poliomyelitis	2						2
Scarlet fever		1					1
Tuberculosis	10	52	10	33	16	28	149
Typhoid fever	37	61	10	29	31	10	178

[1] Includes the city of Habana.

FINLAND

Notifiable diseases—4 weeks ended October 5, 1940.—During the 4 weeks ended October 5, 1940, cases of certain notifiable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Diphtheria	283	Poliomyelitis	91
Influenza	1,012	Scarlet fever	486
Paratyphoid fever	170	Typhoid fever	23

JAMAICA

Communicable diseases—4 weeks ended November 23, 1940.—During the 4 weeks ended November 23, 1940, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chickenpox	2	8	Puerperal sepsis	1	3
Diphtheria	3	2	Scarlet fever	2	
Dysentery	16	13	Tuberculosis	23	82
Erysipelas		1	Typhoid fever	9	50
Leprosy	2				

YUGOSLAVIA

Communicable diseases—4 weeks ended October 6, 1940.—During the 4 weeks ended October 6, 1940, certain communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	66	5	Poliomyelitis	13	
Cerebrospinal meningitis	69	21	Scarlet fever	250	3
Diphtheria and croup	646	31	Sepsis	10	3
Dysentery	404	40	Tetanus	53	25
Erysipelas	189	8	Typhoid fever	434	32
Favus	6	2	Typhus fever	4	1
Lethargic encephalitis	1		Weil's disease	1	
Paratyphoid fever	31				

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Health, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place		January–September 1940	October 1940	November 1940—week ended—				
				2	9	16	23	30
ASIA								
Ceylon	C				1			
China:								
Dairen	C	2						
Foochow	C	481	85					
Hong Kong	C	758	51	9	19	7	3	
Macao	C	365	143	8	12	5		
Manchuria	C	31						
Shanghai	C	465	98	1	4	2	1	
Shantung Province	C	244						
India	C	43,094						
Bassein	C	164						
Bombay	C	13						
Calcutta	C	1,892	116					
Cawnpore	C	329	4					
Chittagong	C	4						
Madras	C	1						
Moulmein	C	16						
Porto Novo	C	1						
Rangoon	C	43						
Vizagapatam	C	20	1					
India (French)	C	34						
Indochina (French)	C	436						
Thailand	C	235						

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE

[C indicates cases; D, deaths]

Place		January–September 1940	October 1940	November 1940—week ended— 2	9	16	23	30
AFRICA								
Algeria	C	20	2					
Plague-infected rats		2						
Belgian Congo	C	21	2					
British East Africa:								
Kenya	C	9						
Uganda	C	156						
Egypt	C	[1] 409						
Madagascar	C	472	17		16		21	25
Morocco.[2]								
Rhodesia, Northern	C	1						
Senegal:								
Dakar	D	[3] 1						
Thies	C	1						
Tivaouane	C	3						
Tunisia: **Tunis**	C	5	1		1	2	1	
Plague-infected rats		1						
Union of South Africa	C	25						
ASIA								
China.[4]								
Dutch East Indies:								
Java and Madura	C	294						
West Java	C	8						
India	C	14,438						
Bassein	C	18						
Cochin	C	1						
Plague-infected rats		3	2					
Rangoon	C	6						
Indochina (French)	C	3						
Thailand:								
Bangkok	C	3						
Bisnulok Province	C	3						
Chingmai	C	3						
Dhonpuri Province	C	1						
Jayanad Province	C	3						
Kamphaeng Bajr Province	C	29						
Kanchanapuri Province	C	12						
Koan Kaen Province	C	5						
Nagara Svarga Province	C	30						
Noangkhay Province	C	4						
Sukhodaya Province	C	22						
EUROPE								
Portugal: Azores Islands	C	2						
SOUTH AMERICA								
Argentina:								
Catamarca Province	C	8						
Cordoba Province	C	[5] 31	[6] 12					
Jujuy Province	C	9						
La Rioja Province	C	1						
Salta Province	C	8						
San Luis Province	C	1						
Santiago del Estero Province	C	76	3					
Tucuman Province	C	20	1					
Brazil:								
Alagoas State	C	9						
Pernambuco State	C	4						
Ecuador: El Oro Province	C	6						

[1] Includes 5 cases of pneumonic plague.

[2] A report dated May 11, 1940, stated that there was an epidemic of bubonic plague in southern Morocco where several hundred cases had been unofficially reported.

[3] Imported.

[4] Information dated July 7 states that up to July 6, 17 cases of plague had been reported near Tungliao, Hsingan Province, China; and a report dated July 13 states that an outbreak of bubonic plague occurred along the Yunnan-Burma border in the districts of Loiwing, Chefang, Juili, and Muchieh. Information dated Aug. 17 states that 45 cases of plague with 36 deaths have occurred in Nungen District and a telegram dated Oct. 2 states that 15 cases of bubonic plague with 3 deaths occurred in Hsinking, Manchuria. During the week ended Nov. 16, 1940, an epidemic of bubonic plague was reported in Ningpo District, Chekiang Province, China.

[5] Includes 11 cases of pneumonic plague.

[6] Includes 4 suspected cases of pneumonic plague.

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

Place		January–September 1940	October 1940	November 1940—week ended— 2	9	16	23	30
Peru:								
Cajabamba Department	C	1						
Cajamarca Department	C	27						
Lambayeque Department	C	12						
Libertad Department	C	47						
Lima Department	C	47						
Piura Department	C	6						
Tumbes Department	C	[1] 19						
OCEANIA								
Hawaii Territory: Plague-infected rats		39	4					

[1] Includes 3 suspected cases.

SMALLPOX

[C indicates cases; D deaths]

AFRICA								
Algeria	C	5						
Angola	C	103						
Belgian Congo	C	3,010						
British East Africa	C	52						
Dahomey	C	52	19	8	2			
French Guinea	C	13						3
Gibraltar	C	[1] 1						
Ivory Coast	C	113			6		12	
Nigeria	C	2,028						
Niger Territory	C	599			8			33
Nyasaland	C	74						
Portuguese East Africa	C	1						
Rhodesia:								
Northern	C	6						
Southern	C	204	23					
Senegal	C	145					1	3
Sierra Leone	C	10						
Sudan (Anglo-Egyptian)	C	518	7		4	1	1	1
Sudan (French)	C	1		1			1	
Union of South Africa	C	106						
ASIA								
Arabia	C	255						
China	C	830	1			1		
Chosen	C	533						
Dutch East Indies—Sabang	C	4						
India	C	154,740						
India (French)	C	5						
India (Portuguese)	C	20						
Indochina (French)	C	1,297	41		32		19	
Iran	C	177						
Iraq	C	479	138	44	20	44	38	11
Japan	C	500						
Straits Settlements	C	1						
Sumatra	C	1						
Thailand	C	182	7	3	3	1	5	
EUROPE								
Great Britain	C	2						
Greece	C	23						
Portugal	C	354	7	3	3			
Spain	C	605						
Turkey	C	139						
NORTH AMERICA								
Canada	C	7	2		2	1		
Guatemala	C	35						
Mexico	C	55						
SOUTH AMERICA								
Bolivia	C	288						
Brazil	C	3						
Colombia	C	1,570						
Ecuador	C	1						
Peru	C	104						
Venezuela (alastrim)	C	167	11					

[1] Imported.

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases; D, deaths]

Place		January–September 1940	October 1940	November 1940—week ended— 2	9	16	23	30
AFRICA								
Algeria	C	1,784	35		32		23	
Belgian Congo	C	1,210						
British East Africa	C	2						
Egypt	C	3,595	20	4	2	10	5	
Eritrea	C	40						
Morocco	C	277						
Rhodesia, Northern	C		7					
Tunisia	C	515					8	16
Union of South Africa	C	154						
ASIA								
China	C	2,100	27					
Chosen	C	359						
India	C	3						
Indochina (French)	C	2						
Iran	C	233						
Iraq	C	128	28					2
Japan	C	2						
Palestine	C	125	49	7		12	3	7
Straits Settlements	C	7	2					
Sumatra	C	[1] 1						
Trans-Jordan	C	15						
EUROPE								
Bulgaria	C	139	6		2	3	2	
Germany	C	213						
Greece	C	34	3		1			1
Hungary	C	77	1					
Irish Free State	C	10						
Lithuania	C	115						
Rumania	C	1,248	8		2	2	10	7
Spain	C	14						
Turkey	C	515	9					
Yugoslavia	C	282						
NORTH AMERICA								
Guatemala	C	279	2					
Mexico	C	192	5	1	1			
Panama Canal Zone	C	3						
SOUTH AMERICA								
Bolivia	C	626						
Chile	C	275						
Ecuador	C	2						
Peru	C	667						
Venezuela	C	11	1					
OCEANIA								
Australia	C	10						
Hawaii Territory	C	21	1				3	

[1] For the month of July 1940.

YELLOW FEVER

[C indicates cases; D, deaths]

AFRICA								
Belgian Congo: Yatolet	C						1	
Cameroon: Nkongsamba	C	[1] 1						
French Equatorial Africa: Fort Archambault	C	[1] 1						
Gold Coast	C	1						
Ivory Coast [2]	C	[3] 4	[1] 1					
Nigeria:								
Ibadan	C	1						
Oshogbo	C	[1] 1						
Sudan (Anglo-Egyptian): Kordofan Province	C				773		85	
Sudan (French): Segou	C				[1] 1			
Togo (French)	C	1						

[1] Suspected.

[2] During the week ended Dec. 7, 1940, 1 suspected case of yellow fever was reported in Seguela, Ivory Coast.

[3] Includes 2 suspected cases of yellow fever.

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WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER—Continued

Place		January–September 1940	October 1940	November 1940—week ended—				
				2	9	16	23	30
SOUTH AMERICA								
Brazil:								
Espirito Santo State	D	[4]28						
Rio de Janeiro State	D	[4]1						
Colombia:								
Antioquia Department—San Luis	*D*	*2*						
Caldas Department—								
La Pradera	D	1						
Samana	D	1						
Victoria	D	1						
Intendencias and Commissaries	C	1						
Meta Department	D	2	1					
Municipality of Jesus Maria	D	1						
Santander Department	D	1	1					

[4] Jungle type.